



COAL AGE



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A Touch of Velvet

IT WAS well for our friend the mule at this plant that a humane manager put on his thinking cap and evolved the idea that a mule pushed so hard must of necessity slow down in the late hours of the day when coal was "coming good," thereby "tying up" an entry, superheating the driver's language and overworking his whip arm.

We have frequent demonstrations of the fact that a high degree of efficiency is not possible without a feeling among the men of personal interest, and with it, as a natural consequence, personal initiative. In the production of coal this is doubly important, for in each mine there are employed the requisite number of men to take care of the production, based on past records.

To enter into details a little: In each mine we have a certain number of working places that will produce with the necessary equipment and day-labor expense an estimated amount of coal. This may work out all right and come up to expectations. A driver under this system will take care of his stipulated number of rooms and entries and give each loader a fairly good turn per day. Yet if we can add a little personal interest or enthusiasm, it acts like the touch of a magic wand.

The driver no longer borrows the "makins" and "rolls a nail," or sits on the gob while the loader tops off a car. Spurred on by the possibility of reward, by rivalry, or by the hope of establishing some new record, or whatever the incentive may be, he hustles in and out; he "rolls a nail" while waiting for the motor at the passway if someone isn't quite loaded; he helps throw on a few lumps and urges the miner to be ready for the next trip.

Each industry must have its own special way of developing efficiency and applying the improved methods to its own particular case. What would apply to the mining business might not be suitable for other lines of work. But where the day-labor expense is a large

"Push that mule to the limit; what kills one buys another."

In years past, an order that I frequently heard at a certain mine was: "Push that mule to the limit; what kills one buys another."

At this particular plant one could also hear a driver described in admiring tones as "a great coal hauler." "Why, that fellow kills just about one mule a year—just drives them to death."

factor in the total cost per ton—and this outlay is governed entirely by the number of tons handled per man per day—this incentive to hustle will cause an addition to the tonnage that is pure velvet. There is a marked difference in being made to do a thing and in doing it from a sense of duty and performing the same work of one's own volition.

In planning for production some theories of efficiency are based on system. The work to be accomplished by each employee is based on the average of

such accomplishments in the past. To increase this amount without any further expense, there must be some unusual motive, some definite reward that is obtainable. One factor that has an important bearing is to impress upon each employee a sense of responsibility, in order that he will experience pleasure if successful, and disappointment if unsuccessful. Some corporations or their officials have a propensity for importing men to fill positions of importance. They apparently are possessed with the idea that the most capable men live elsewhere. They never consider that home talent, if properly trained, will exhibit qualities necessary to a successful career. There are few industries that have not on their payrolls men capable of great deeds if started in the right way and with the proper incentive. One means of developing this tendency is to employ a definite system in managing the organization.

Each company official should keep careful watch over the men under him; when a desirable position is vacant, let him give someone a chance who has been faithful and diligent. It should be the purpose of all officials to encourage application and stability, to have each employee feel that with his company there is an opportunity, and that the opportunity is contingent upon competency and the faithful performance of duty. This tends to strengthen the fundamental scheme of the organization; it creates enthusiasm, initiative and competency, which in turn mean efficiency and success.

Written by C. P. SHOCKLEY

When Opportunity Knocked

BY EDGAR WHITE*

SYNOPSIS—The story of two young men, showing how one succeeded and the other failed.

When Opportunity knocks she does not expect that everybody will hearken. It is a safe guess that not one in a thousand recognizes the call. But everyone in the thousand has the chance. In the year 1860 Opportunity knocked at the doors of two strong-limbed, healthy young men of 19. Neither had an advantage over the other in wordly goods. Both were pitifully poor.

Alexander Rector was awarded the contract to dig a 25-ft. well for Wilburn Hughes, a farmer living near the then obscure village of Bevier, Mo. He was to get 45c. a day and board. He thought he was doing uncommonly well. Farmhands were glad to get \$10 a month and a place to stay. Alex sang as he toiled, and his well went down day by day. At 12 ft. he ceased singing; his pick encountered slate. Two feet further he struck coal—"black rock," he called it. A drill showed there was 6 ft. of this. He regarded it as an abomination because it would ruin the water unless the well were cased, and even then the stuff might work through. He suggested digging a well in another place, and this time he was not bothered with coal.

The coal discovery didn't excite any particular interest. It gave Rector, who got a job to dig another well, no concern whatever. There was plenty of wood in the forests. Locomotives and steamboats were fueling with cottonwood.

A Macon, Mo., paper printed a brief story of the well-digger's find. By chance a copy of the little weekly got over into Illinois. It fell into the hands of Thomas Wardell, a young Englishman but recently come to America. Wardell was at Kewanee, not waiting for something to turn up, but looking over the field to turn something up. His sole capital was youth, brain and muscle. The next train took him to Missouri. In a week he had satisfied himself of the vast extent of the coal lands and the quality of the product. The farmers about Bevier gladly signed option contracts for anything between the surface of their holdings and China. All they reserved in the bond was a crust thick enough to raise a crop on. Their royalty was a fourth of a cent a bushel. They figured they couldn't possibly lose anything at that, as they burned wood and had no earthly use for coal.

A PROPOSAL TO A RAILROAD PRESIDENT

When Wardell had spiked down enough options to insure the carrying out of heavy contracts he presented himself to the president of the railroad at St. Louis. He told what he had to offer and what he wanted for it.

The president looked at the young man and said:

"Want us to change all our engines so as to give you a job, eh?"

"That is the principal motive with me," he said. "But of course I knew when I came to you that you wouldn't do it unless I could prove that I could deliver all the coal you might need, and that it would be cheaper."

*Macon, Mo.

"And you are prepared to show me that?" asked the official.

"I am," replied the young Englishman.

He then produced his maps, showed the depth of the coal and where it lay. His prospect holes determined the character of the material beyond the shadow of doubt, and he brought with him specimens. Having finished the examination, the president was called to look after other business.

"Come around this afternoon," he said, "and I'll talk with you about this business a little further. Where are you stopping?"

Wardell mentioned a cheap tavern near the levee.

"What?" exclaimed the railroad man. "You come down here to negotiate a fifty-thousand-dollar deal and stop at a fifty-cent-a-day house?"

"Exactly so," replied the young man. "I just had barely enough money to make the trip."

"Then how on earth do you expect to handle such a big contract?"

"You sign it and I'll handle it all right."

"You haven't a sign of security in case you fail?"

"I'll assign my coal options to you. You can't lose."

The lad's courageous, self-reliant demeanor won. A banker had agreed to back him as soon as he demonstrated he could sell the coal. He went home with a contract to furnish a certain number of tons of coal per month to the Hannibal and St. Joe engines, and by the time the road was ready for it Wardell had his tipple, engine house and loading chutes waiting.

MADE SEVERAL MILLION DOLLARS

The history of the wonderful coal development of Macon County is practically a biography of Thomas Wardell, the English lad who began operations without a dollar. He died in 1887 the controller of the greatest mining district in the West, and worth over five million dollars. He established schools, fostered churches and built hundreds of comfortable homes for the miners. His own lordly estate, in the suburbs of Macon, was easily worth a million dollars, and his son's home there, built since the great operator's death, comprises the finest residence and park in northern Missouri. The young man has let go of the coal possessions that made his father, and the purchasers, value them at \$4,000,000. The normal annual output of the 25 mines is over a million tons.

Alex Rector, the discoverer, abandoned well-digging and went to mining. He became an expert miner and could easily make from \$3.50 to \$4 each working day. This made well-digging look contemptible by comparison, and he never resumed his earlier occupation. Through all the years of Wardell's big dealings Rector plied his pick and "shot down" his coal, but he never felt the call to control. He was a good miner and a good man. Rector died a while back, full of years and worth about as much as when his pick struck coal—and spoiled his well.

"If it was to do over again," he remarked a few years before his death, "I expect I would act just the same. Responsibility always fretted me. I haven't anything laid by and I haven't had anything to worry me."

Fire Prevention at Coal Mines

BY H. S. MIKESELL*

SYNOPSIS—A résumé of the precautions taken to prevent fire and the rules of action to be observed in case of one, as adopted by three coal companies in the Middle West. Three precautionary fire signs are employed. Fire-fighting apparatus must be tested periodically and reports of such tests made to the main office.

Apropos of the foreword in the issue of *Coal Age* of Mar. 27 headed "Do You Appreciate the Importance of Effective Fire Prevention?" the publication of rules to be followed for the prevention of fires at the mines of the Rock Island Coal Mining Co., the Consolidated Indiana Coal Co. and the Coal Valley Mining Co., issued under the direction of President Carl Scholz, may possibly be of interest.

Constant vigilance and cleanliness are the best preventives of fires at mining plants. Standing instructions are in effect at these mines that all officers and employees



PRECAUTIONARY FIRE SIGNS NOS. 1, 2 AND 3

must give personal attention to the protection of the company's property from fire, and the officer or employee who fails to do this does not perform his full duty, even though the property concerned may not be directly where he is employed or working. The rules and regulations covering surface plants follow:

STORAGE AND USE OF EXPLOSIVES, OILS, ETC.

- Oil for company's use in shops and warehouses, except where a small quantity is kept on hand, should be kept outside of main buildings. Wherever it is practicable to do so, arrangements should be made to keep it in a building designed for the purpose; in all cases a metal lined box with a sand base shall be provided on which to clean and fill lamps and keep oil cans.
- Explosives should not be used or stored except under prescribed conditions.
- The use of benzine, gasoline or naphtha for mechanical purposes in any building will not be permitted, except in cases where the written approval of the general manager and insurance department, both as to quantity and purpose, has been obtained. When used, it should be only in restricted quantities, by daylight only, and from approved safety cans. Where gasoline power is used, special care should be given to oil pumps to see that oil is not leaking.

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- Supplies of benzine, gasoline or naphtha must be kept only in structures especially provided for the storage of those fluids.

LIGHTING AND HEATING

- Gas and lamp fixtures must be rigid. Burners must be protected by wire guards or globes so that heat or flame cannot reach woodwork or other inflammable material. Woodwork above or alongside gas jets or lamps must be protected with asbestos board and tin.

- Kerosene oil lamps with glass fonts are objectionable. Lamps with metal fonts must be used.

- Paper or pasteboard shades must not be used on any light globe. Metal or porcelain should be used.

- Place wire guards on all electric-light globes used in record rooms and see that lamp cords are short enough so that lights cannot be placed inside pigeonholes or on shelves.

- The use of torches is attended with danger, and every precaution should be exercised when they are used, both as to handling and storing. They must be kept in metal receptacles when not in use and not in wooden closets.

- The use of open lights in powder houses, oil houses, paint houses, etc., and where inflammable vapors or dust are present is prohibited.

- The use of gasoline stoves for cooking or heating purposes or of gasoline for lighting in warehouses and other buildings is prohibited unless by consent of the general manager.

- Furnaces, stoves, pipes, flues and chimneys must be thoroughly examined by the employees in charge as often as necessary for defects which might entail risk of fire. These defects must be speedily remedied.

- Portable furnaces using petroleum oils should be removed from buildings when not in actual operation. See that all oil is turned off at main supply tank at night on all oil systems.

- Pails of fine dry sand should be maintained at all places where oil and grease are stored.

- Furnaces and stoves for heating buildings must be securely set on stone, concrete, cemented brick or metal. Woodwork near furnaces and stoves or stovepipes must be protected by sheet metal and air spaces must be provided where stovepipes pass through woodwork. Stovepipes must not pass through concealed places, such as an attic, or enter a flue in concealed places. The stovepipe inside of a building must be in plain view. Where stovepipes pass through record and file rooms, care shall be taken to see that papers are kept sufficiently far away from them and that a metal guard or screen is provided to prevent contact.

POWER

- Steam pipes must rest on metal supports and not be placed too close to woodwork. They should be kept free from greasy or oily waste and other inflammable material. Clothing must not be hung on or near steam pipes.

- Dust must not be allowed to accumulate on top of boilers, and tops of boilers must not be used for drying combustible materials.

- DYNAMOS, MOTORS AND ELECTRIC-LIGHT WIRING IN BUILDINGS must be properly insulated and equipped with safety devices. Wiring should be overhauled and inspected regularly and kept up to standard, especially in buildings where the wiring is not of recent installation. All telephone wires before entering buildings of the company should be protected by lightning arresters, and in cases where they are liable to come in contact with high potential wires, by excessive current protectors. No person should be allowed to make alterations or repairs of any kind to electrical equipment or apparatus except upon the authorization of the general superintendent. Wiring of all kinds must be installed and maintained according to the rules of the National Electric Code.

- SMOKING IS PROHIBITED IN POWDER HOUSES, MAGAZINES, STABLE BUILDINGS, SHOPS, STOREHOUSES AND Warehouses AND AT ALL POINTS WHERE INFLAMMABLE MATERIALS ARE HANDLED. Lighted cigarettes, pipes and cigars must not be brought inside of buildings. Signs to that effect should be posted conspicuously.

- GREASY AND OILY WASTE MUST BE KEPT IN APPROVED METAL CANS, WITH SELF-CLOSING COVERS. WASTE CANS MUST BE EMPTIED AT THE CLOSE OF EACH DAY'S WORK, AS THE COMBINATION OF OIL AND WASTE OR RAGS UNDER CERTAIN CONDITIONS WILL CAUSE FIRE BY SPONTANEOUS COMBUSTION.

21. Sawdust must not be used in spittoons; sand must be used. Wooden spittoons are prohibited.

22. The use of matches in and around buildings should be avoided as much as possible; but when they are necessary, safety matches should be provided and care should be taken to see that they are extinguished after being used. When kept in stock, metal boxes should be provided for them.

23. Dirt, rubbish and inflammable material must not be allowed to accumulate in or about tipples, shops, warehouses, buildings or premises of the company. Attic space must not be used for storage purposes.

24. Oil lamps must not be filled after dark or near a fire, and where such work is done care should be taken to keep the surroundings free of oil saturation by having metal-covered stands provided on which to do that work.

25. Ashes must be handled in metal utensils and be removed every day. Ashes must not be kept in wooden boxes nor thrown against sides of buildings or platforms.

26. The use of unventilated wooden closets for men's clothes and supplies is not approved. Well-ventilated metal closets or lockers (to be kept away from wood structural material) are recommended for workmen's clothing and tools.

27. All dry grass, weeds, etc., must be removed if near wooden structures.

28. Fire barrels must be kept filled, and salt or calcium chloride be added to the water in them where it is likely to freeze. Fire hose, fire plugs and other fire appliances must be tested and kept in good condition, fire brigades be organized and drilled at least monthly and employees be instructed as to the use and method of handling fire extinguishers. A good supply of barrels and fire pails should be provided for all shops, warehouses and tipples.

29. General superintendents will appoint at each mine a responsible employee to act as fire chief. The fire chief will be in direct charge of the fire brigade and will be held responsible for the efficient condition of all fire-fighting apparatus on the premises. He will inspect all property thoroughly and regularly to see that premises are kept clean and free from any features which might cause fire. He will further complete and submit to the general offices once every 10 days a report of practice run of fire brigade on form 2617.

30. Where there are locked fire-alarm boxes near or in shops, warehouses and other buildings, the key must be procured and hung up in a conspicuous and accessible place. Fire-alarm boxes or wires should not be attached to buildings.

31. General superintendents will post warning signboards in conspicuous places on powder houses, magazines and stable buildings and on such other buildings where signs are necessary. On powder houses and magazines, use signboards Nos. 2 and 3, as shown on p. 161. At entrance to gaseous mine or district, use signboards Nos. 1 and 3, as shown. On and in stable buildings, use signboards Nos. 1 and 3, as shown. Wherever smoking is prohibited, use signboard No. 1. On and in oil houses, shop buildings and storehouses, use signboards Nos. 1 and 3. These signboards may be made of wood alone, wood covered with sheet tin, iron or copper, or of solid sheet copper, or of steel. The background must be painted white. Lettering must be in black, except lettering in center of red symbol, which must be white. (See illustration.) The center symbol must be bright red. Signboards must be 4 ft. 6 in. long and 16 in. wide. Lettering must be 3 in. in height.

REPORTS TO BE FURNISHED PERIODICALLY

1. Regular monthly reports are rendered the general office showing progress made in carrying out the recommendations of the Insurance Department for improved fire protection, which are made by inspectors at intervals, showing by item and survey numbers the status of each recommendation.

2. General superintendents forward to the general office once each month form CT-117 showing corrections to be made in the insurance schedule.

3. Fire brigade chiefs submit to the general office once every 10 days a report of practice run of fire brigade on form 2617.

4. Requisitions are made promptly on the purchasing department for supplies necessary to carry out instructions contained in the rules and regulations for the prevention of fires.

At each group of mines a fire-fighting force is organized with a brigade established at each mine. Fire drills are run at intervals so that all employees both inside and outside of the mine know their respective places of duty and the work expected of them in case of an emergency.

Pipe lines are established under pressure near the bottom of shafts, both upcast and downcast, with connections to hose and pipe lines leading over different portions of the mines.

Underground telephone service is established in each mine to the most important inside stations, principally where hoisting motors are located, so that help can be quickly called. This telephone line is connected with each local office headquarters and also with the mine office. Gongs are placed whereby a general alarm can be sounded from the surface or the shaft bottom to the inside workings, from whence information can be carried by drivers to the men in case quick retreat is desired.

TIMBERS ARE PROTECTED

A pulp-plaster covering for timbers at the shaft bottom is used in order to render them more nearly fireproof, and holes and openings which would lead flames back of timbers are closed and sealed with pulp plaster as well.

No underground stables for mules are permitted, and all mules are lowered into the mine at the beginning of work and taken out at quitting time in the evening.

No oils are permitted to be taken back any distance into the mines, particularly gasoline and kerosene. The places where pit cars are oiled are covered with ashes, cinders or sand, which will absorb the oil and enable it to be readily loaded out. This prevents the oil from saturating the slate flooring and timbers. Not more than one day's supply of oil for lubricating pit cars is allowed in the mine at any one time. Before pit-car oil is taken into the mine it is tested with an open light placed over the vessel in which it is contained to see that the vapors are not inflammable or will not ignite.

In addition to the check system, a bar chain is put across the entry at least 15 ft. from the cage bottom in each mine, to prevent crowding of men to a place nearer than this distance in case of trouble. Large quantities of scrap pipe which are practically worthless are filled with concrete and used for permanent cribbing to prevent fire hazard, instead of using wooden timbers.

Lamp houses are located on the surface convenient to the shaft opening. All lamps are filled on top, and no lamps are filled at the bottom of the shafts or elsewhere underground.

RULES GOVERNING ACTION IN CASE OF FIRE

The following fire rules are in effect:

1. All fire equipment shall be tested each week in actual drill, both on the surface as well as in the mine workings.

2. The alarm of fire on the surface shall be short continuous blasts of the steam whistle.

3. The ringing of the electrical alarm gongs indicates fire in the underground workings, the signals being as follows: (a) Continuous unbroken ringing of the gongs means that all employees should go to the main shaft. (b) A succession of short rings of the gongs means that all employees should go to the escapement shaft.

4. Upon hearing the fire-alarm gongs it will be the duty of the pit boss and his assistants to go to their respective stations at the bottom of each shaft, as directed by the superintendent, to give directions and preserve order.

5. After the fire alarm has been given, either on the surface or below ground, no coal except that on the ascending cage must be hoisted, and both cages must be immediately relieved of cars.

6. All men upon hearing the alarm of fire must immediately go to their respective stations and prepare the pumps, hydrants, hose and chemical extinguishers for action.

7. Hoisting engineers must remain in the engine room and obey regular signals and the orders of the superintendent or mine manager.

8. The firemen must remain at the boilers unless otherwise directed by the superintendent or pit boss.

9. The head dumper or weigh boss, as may be directed, shall have charge of the gates and guard the shaft at the surface landing and attend to mine signals.

10. The bottom cager will retain charge of the cages and attend to fire-alarm and other signals at the shaft bottom.

11. The machinist's duty will be to stand by and attend to the fire pumps only.

12. It shall be the duty of the head blacksmith to open valves for conveying water to the fan house and all water pipes on the surface and in the mines.

13. Certain assigned duties shall be given to a sufficient number of men to take charge of valves connected with all underground fire pipe lines, handle the hose on the surface and in the workings and take charge of the chemical extinguishers, in the surface buildings as well as in the mine.

14. Under no circumstances must hay be permitted to be loaded into a car and sent into the mine until all miners of the day shift are on the surface, and it must then be lowered into the mine only after it has been inspected by the hoisting engineer or top foreman to see that it has been thoroughly wet to make it impossible of ignition from any cause, and the hoisting engineer on duty at the time is charged with the knowledge of such inspection.

15. The first duty of the night watchman or such other person as may be designated by the superintendent (when the weather permits) shall be to unreel two lines of hose (one on each side of the mine) and open the hydrant valves.

16. On the discovery of fire at night, the steam whistle must be blown continuously and the electric alarm gongs sounded as indicated in Rules 2 and 3.

17. The night forces must, upon the alarm of fire, go to their regular stations and duties as assigned to them by the superintendent.

The greatest degree of protection and safety to life and property can only be secured by cool, active action on the part of those in charge of the supervision of the forces and those in charge of the fire apparatus, as well as by calmness and good order on the part of all employees in leaving the mine.

Fire apparatus must not be handled by anyone except those authorized to do so, and then only in case of fire or for the purpose of drill or repairing. Any person known to have mutilated or damaged any part of the fire machinery and appliances will be prosecuted, and in addition thereto will, if an employee, be discharged.

USE OF FIRE EXTINGUISHERS

The following instructions are in effect governing the use and care of fire extinguishers:

The employee in charge of the building in which chemical fire extinguishers are located is required to see that these extinguishers are kept in their proper location, clean and in order for immediate use at all times, and that a proper record of the date when each was last charged is registered on the tag attached to the extinguisher. Except in case of fire these extinguishers are not to be tampered with or discharged, other than for testing purposes once each year, on July 1, on which date all chemical extinguishers must be discharged and recharged. Requisitions for recharge should be made on the purchasing department and should specifically state the capacity and makers' name of the extinguisher.

A report is made twice a year showing in what buildings fire extinguishers are located and the number in each place, number of recharges on hand, if rubber connections are in good order and if there is a fire-extinguisher placard, issued by the insurance department, posted near each extinguisher, giving instructions for its use and care.

All employees, particularly the fire brigade, are instructed as to the use of fire extinguishers and their location. All fire extinguishers are recharged a week or

ten days after July 1 of each year, and a tag is attached to each fire extinguisher showing the date of recharging. Fire extinguishers are filled with a solution of sulphuric acid, sodium bicarbonate and water in proper proportions. The extinguisher used is the one manufactured by the Northern Fire Apparatus Co., Minneapolis, Minn., and is the standard adopted for all mines.

All boilers are covered by insurance against explosions, and inspections are regularly made by representatives of the Insurance Department and the insurance company carrying the risk, with reports rendered showing condition of boilers and repairs needed. Boilers are not permitted to be operated under steam pressure above that stipulated by the insurance company. Violation of this rule results in the discharge of the employee at fault. All boilers are numbered consecutively at each plant, and a statement is rendered twice each year showing the location, nature of the building in which it is housed, type of boiler, allowable steam pressure, size of the boiler and the purpose for which it is employed.

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Carbonization of Peat

The Swedish experts commissioned to examine Laval's method of carbonizing peat, says *Commerce Reports*, submitted their report on Mar. 19. Briefly stated, the processes employed in this method are as follows: The peat is diluted with a large quantity of water. The resulting pap is then heated to a temperature of 150° to 250° C. (302° to 482° F.). The chemical changes thus produced leave a dry mass of an increased heat value, though reduced in volume, the physical constitution of the material being altered in such a way that water can be removed in a much larger proportion.

By artificial drying peat powder is then easily prepared, to be used in the manufacture of briquettes. With a small apparatus the commission had no difficulty in preparing a product containing only 52 per cent. of water. The experts were of the opinion that a small plant manufacturing 10 tons of peat fuel per day would have to reckon with a cost of at least 15 crowns (\$4.02) per ton of peat powder containing 10 per cent. of water and having an effective heat value of 4800 calories, the cost not including interest or amortization. In their opinion, however, better results might be expected for a larger plant manufacturing at least 50 tons of fuel per day. Here the cost was reckoned at 13 crowns (\$3.48) per ton, including interest and amortization.

Under normal conditions a majority of the experts believed such peat fuel could be sold with profit. Captain Wallgren, one of the five experts, filed a dissenting opinion. He calculates the original cost of producing 1 ton of water-free peat powder, with an effective heat value of 5240 calories, at 11.21 crowns (\$3), exclusive of interest and other charges, which would increase the cost of production to 15 or 16 crowns (\$4.02 to \$4.29). He holds, therefore, that peat fuel cannot compete with coal under normal conditions. The possibilities of improving the working methods, however, are great, and should the prices of coal remain high, even after the war, the prospects for marketing peat fuel will be good.

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The weight in pounds per 1000 ft. of any electrical conductor may be found by multiplying its area in circular mils by the pounds per 1000 ft. per circular mil.

The Canadian Collieries, Ltd.

BY E. JACOBS*

SYNOPSIS—After meeting and discussing fully the affairs of the company, the bondholders of the Canadian Collieries, Ltd., voted unanimously to waive default of payment of interest on the bonds for three years or until one year after the conclusion of peace in Europe.

At the annual meeting of the Canadian Collieries (Dunsmuir), Ltd., held in London in March, the affairs of the company were fully discussed and resolutions unanimously adopted waiving the defaults which the company had made on Sept. 1, 1914, and Mar. 1, 1915, in payment of interest on its bonds.

This waiver covers a period of three years; that is, until Mar. 1, 1918, or as the resolutions prescribed "to the

at the meeting. As the chairman pointed out, there were three alternatives open to the bondholders: (1) They could establish a receivership, (2) they could commence the foreclosure of the mortgage, or (3) they could waive the default and extend the time for payment of the bond interest.

The last-mentioned alternative was unanimously adopted, and to that end the meeting appointed a committee of five of the bondholders. In this committee was vested a voting trust, giving it entire control over the administration and management of the company. The five members are Stanley C. Boulter, Robert H. Benson, David A. Bevan, John A. Mullens, Jr., and Ernest G. Ridpath.

The full report of the meeting includes many interesting features. W. E. Rundle, general manager of the



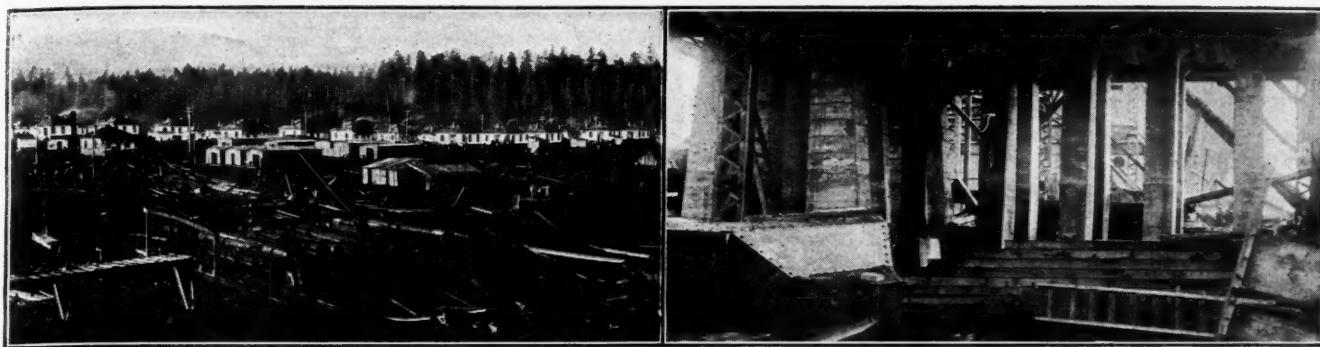
TIPPLE OF THE NO. 8 MINE OF THE CANADIAN COLLIERIES CO.

half yearly date for payment of interest upon the bonds occurring next before the expiration of one year from the formal conclusion of peace between Great Britain on the one hand and Germany and Austria on the other hand (whichever period may be the longer). Then the bond interest shall be payable only as and when and to the extent that the net profits of the company as certified by the auditors of the company for the time being are sufficient to pay the same, any arrears of such interest being nevertheless carried forward and paid out of the net profits of any subsequent year."

The reason for this and other modifications of the trust deed of Aug. 6, 1910, securing the 5-per cent. first-mortgage gold bonds of the company, were fully explained

National Trust Co., Ltd., trustee for the bondholders, presided. During the discussion he stated that Sir William Mackenzie (of Mackenzie & Mann, of Toronto, Ont., at the head of the Canadian Northern and the Canadian Pacific railways) is now a director of the National Trust Co. E. R. Wood and F. H. Phippen are also directors. He also stated that of 22 directors of the National Trust Co., only two were also directors of the Canadian Collieries Co., and he gave assurance that those two had not at any time attempted to influence the trustees with regard to anything arising out of the trusteeship; also, that the National Trust Co. had ably administered this trusteeship. So far as the National Trust Co. is concerned, the chairman stated that it has no interest in the Canadian Collieries company save as trustee. It does not

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MINERS' DWELLINGS AT NO. 8 MINE, CANADIAN COLLIERIES CO.

own a dollar's worth of bonds or stocks in the Collieries company nor any stock in the Canadian Northern Ry.

H. S. Fleming, chairman of the Executive Committee of the Canadian Collieries company, explained at length the causes leading to the present condition of the firm. After reviewing the two years' strike of the miners, he referred to the trade depression, saying in this connection: "To show you the direct effect which this has had upon the position of the company, I may state that during last winter the total consumption of domestic coal in the city of Vancouver was barely one-half of what it had been two years before. This of course affected all the coal-mining companies on the British Columbia coast, but the Collieries company most, for the reason that it is the largest. The use of coal for industrial and public purposes has been similarly cut down. The war disorganized shipping, and there was and is little demand for supplying ships' bunkers with coal; in addition, there was the increased use of fuel oil."

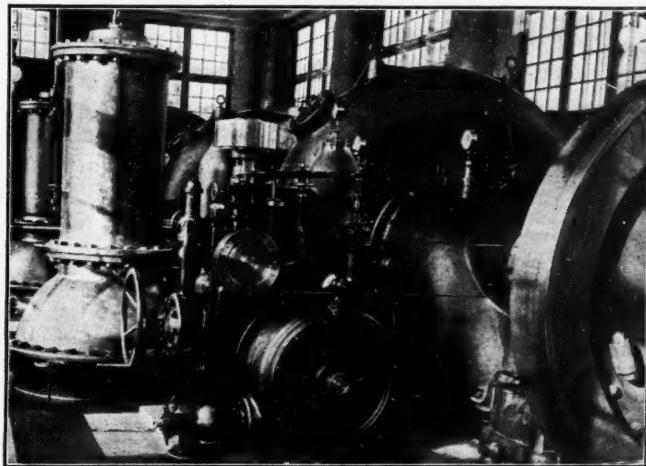
SUBSTANTIAL PROFITS CAN BE EARNED

It was stated, however, that with large orders received from San Francisco and elsewhere during August and September of 1914 the company in those months earned net profits of \$46,000 and \$54,000 respectively, but in October and November following, the net profits were only \$1300 and \$1100. It is believed that the August and September results show that if given even a moderately good market for the coal the company's mines are capable of earning substantial profits, and that the money put into the property has not been wasted. It is confidently believed that the market is certain to come sooner or later, that the war cannot last forever, nor will the

REINFORCED-CONCRETE SUBSTRUCTURE OF TIPPLE OF NO. 8 MINE

depression of trade. The Pacific Coast will begin to grow again in population and in industry.

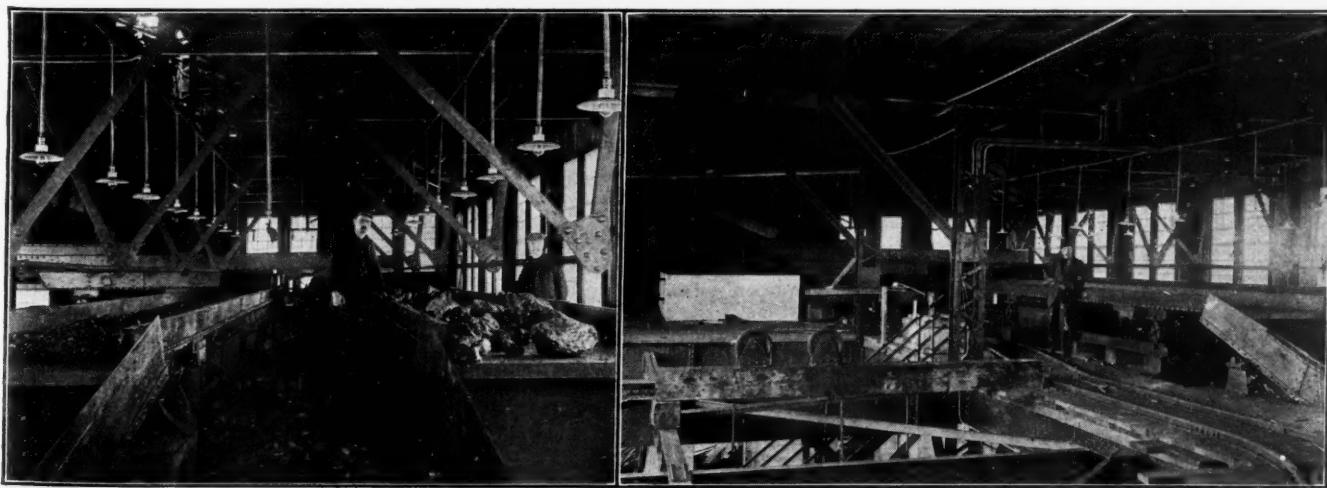
Replying to a question regarding the serious shrinkage of the profits between the times the mines were worked by the Dunsmuir interests and the date of the statement of accounts presented, Mr. Fleming said that the operating earnings in the year ended June 30, 1911, were \$665,000 from the mines or \$728,000 from all sources.



INTERIOR OF POWER HOUSE

During the next year they were \$546,000 from the mines and \$751,000 from all sources. During the succeeding year there was a strike which practically stopped operations at the mines for a short time and made it difficult to produce coal.

In regard to the money subscribed, \$3,500,000 of this has gone into improvements in the mines and property



MARCUS SCREENS IN NO. 8 TIPPLE IN OPERATION

INTERIOR VIEW OF NO. 8 TIPPLE DURING CONSTRUCTION

generally. A considerable sum subscribed has not been taken as working capital owing to the Dunsmuir's not having delivered to the company all the assets that were expected would be received; but a decision as to this was now being obtained from the Privy Council of Great

Britain. No directors of the company receive a salary except two local directors who are each paid \$500. Many other questions were answered before the resolutions were voted on and adopted unanimously, as has been previously stated.

The Anthracite Decisions

BY OUR PHILADELPHIA CORRESPONDENT

SYNOPSIS—The Delaware, Lackawanna & Western R.R. has been found to be operating unlawfully and has made the necessary readjustments of its management. The Philadelphia & Reading Coal & Iron Co. was found to be conducting its business lawfully, but the relation between the Central Railroad of New Jersey and the Wilkes-Barre Coal Co. must be dissolved.

The two recent court decisions involving the Reading and the Lackawanna anthracite interests coming practically at the same time have served to focus interest on the apparently divergent decisions in the two instances. However, the difference between the two decisions, as suggested, is really only on the face, and as a matter of fact the results are so likely to tend to the same end that it is worth while to study them together.

In the first place it is well to remember that the suits were brought by the United States Government, both being based on the commodity clause of the Hepburn Act of 1906, the provisions of which became effective May 1, 1908, and in express terms prohibited any railway company engaged in interstate commerce to both mine and transport coal; or in still plainer words: "No railroad company can engage in the coal business; its sole purpose is that of a carrier of goods for other people."

It is also important to bear in mind that while the decision in the Lackawanna case was handed down by the United States Supreme Court and is final, yet the decision in the case of the Reading was the verdict of the United States District Court for Pennsylvania, and this opinion is subject to review by the United States Supreme Court, which appeal will probably be taken.

As stated, the decision in the Lackawanna issue was made by the United States Supreme Court and was a reversal of the opinion delivered by the United States District Court for New Jersey, from which opinion the Government had appealed. The decision of the Supreme Court, which was unanimous, was that the Delaware, Lackawanna & Western R.R. did violate the commodities clause of the Hepburn law, and practically the entire evidence adduced to sustain this decision was based on the now celebrated "65 per cent. contract." This contract provided that the coal company should buy from the railroad company (which latter company both owned and operated the mines) all the coal mined, the price to be paid the railroad company to be 65 per cent. of the New York price on the day of delivery. The coal company was also prohibited from buying coal from any other company without permission from the railroad company.

It was contended that the nature of such a contract made it possible for the railroad company to charge exorbitant prices to the public; raise the New York prices; influence prices by the failure to make prompt delivery or by suspending operations in times of urgent need, thereby tending to increase the New York price; together with a number of lesser and minor objections.

ABILITY TO INJURE SHOULD NOT BE URGED AS A PROOF OF INTENTION

Strictly and literally construed the companies under this contract could do all the things imputed to them; that is, such wrong-doing was within the bounds of possibility; but the essential point brought out in the Supreme Court decision was that *the companies did not do any of them*, and as a matter of fact the Delaware, Lackawanna & Western R.R. never could do any or all of the things so mentioned, for the very reason that that company only produces 10 per cent. of the entire output of coal.

The potential element for evil in the contract was very much less than that of Jake Landis, an aged contractor who built a church. He had made a blunder and was sore perplexed. A venerable deacon stood within the walls of the church and rushed up to one of the stone masons, tears streaming from his eyes:

"Choe, tell Chake not to swear!"

"He's not swearing," answered the man.

"Yes; but he might!" bawled the deacon.

And just so it was admitted in the opinion as written by Justice Lamar, although not in just that way. He said: "It is argued that the present objections to the contract are purely academic," or in the words of the layman, technical. Continuing the justice says: "But the validity of the contract depends upon its terms," and these terms the court has just decided are unlawful, even though they have harmed no one. It is the law, and the court says in its interpretation or reading of the law that the railroad company was a seller of coal on the one hand, and the coal company, as a coal company, was neither an independent buyer nor a free agent.

The decision directs that the railroad company shall entirely disassociate itself from the coal company, and as is already well known such steps have been taken by the latter company. A few days ago an entirely new directorate was elected, none of whom were officials in the railroad company. The offices were removed so that they would no longer be in the same building with the railroad concern. The coal company will be a free agent in the purchase of coal, for it will not only take fuel from the railroad mines at a fixed price, with the 65 per cent. clause eliminated, but it will have perfect freedom to purchase from any one offering to sell.

The decision is most helpful in that it plainly interprets the law for the guidance of all. The coal companies are law-abiding, as is proved by the fact that the "Lacka-

wanna" changed its contract over a year ago in order to comply with the law, but the present suit was based upon the existence of a contract prior to that time. In this connection President Loomis, of the Delaware, Lackawanna & Western R.R. Co., states: "We are anxious to do anything that is asked of us by the court. We have nothing to conceal, and we are glad to have a final decision for our guide."

In referring to the recent decision of the United States District Court in favor of the Philadelphia & Reading Coal & Iron Co., it will be well to recall that three years ago the Government brought suit against all the anthracite roads as a general combination, which suit was lost. After this decision the Government decided upon suing the so-called smaller combinations, and the present decision is the outcome of the suit started against the Reading company two years ago.

PHILADELPHIA & READING COAL & IRON CO. COMPLETELY EXONERATED

In this decision, as written by Judge McPherson, with the concurrence of Judges Buffington and Hunt, the Reading company is adjudged not guilty of a violation of the commodities clause of the Hepburn act. The decision states that the evidence did not show that the Reading had any connection with the Lehigh Coal & Navigation Co. except a minor but nevertheless legal agreement made in 1871; that there was no evidence of injury to any coal dealers; that the company never demanded a high price when coal was in greatest demand, although it was shown that this was a common practice among individuals. Neither was the price of coal at any time unreasonable when it was considered in the light of the profit returned to the company. This was conclusively proven to be 18c. per ton, and even when some miscellaneous receipts were added the profit was only raised to 20c.

The decision further stated that while the connection of the Lehigh & Wilkes-Barre Coal Co. with the Central R.R. of New Jersey had not been brought into question, yet the court advised that inasmuch as the Reading company controlled the C. R. R. of N. J., the Lehigh & Wilkes-Barre Coal Co. should be separated from the transportation company, as "the union of control by the railroad company is objectionable."

The remainder of the decision shows that the Philadelphia & Reading Coal & Iron Co. is a separate and distinct corporation in its relations to the Philadelphia & Reading Ry.

To a close observer this separation has been going on over a period of years, in compliance with decisions handed down some years since. It actually began as far back as 1906 when all the employees of the Philadelphia & Reading Coal & Iron Co. were deprived of free transportation on the Philadelphia & Reading Ry., a privilege which they had enjoyed on equal terms with the railway employees. The separation continued in various ways until the retirement of C. E. Henderson, who for years had been second vice-president of the railway company and general manager of the coal company. At that time the coal company elected a general manager separate and distinct from any affiliation with the railway company, and finally two years ago upon the death of George F. Baer the coal company elected its own president.

It can now be truly said, because of these two apparently diverse decisions, that the Delaware & Lackawanna Coal

Co. and the Philadelphia & Reading Coal & Iron Co. both have the same corporate status in the eyes of the law, the only point of difference, if it can be so called, being that the Philadelphia & Reading Coal & Iron Co. arrived at that point several years ahead of the Lackawanna company.

COMPANIES CAN DEVOTE ENERGY TO MINING

Now since these two companies have adjusted themselves to the requirements of the law, as clarified by the two decisions, it is right and proper to state that they have not at any time, to use the words of the decision in the Reading case, "consciously and deliberately violated the law, for the commodity clause of the Hepburn act of 1906 rendered unlawful many things which were lawful under the statutes of the states," previous to the enactment of the Hepburn law of 1906, and it was these state statutes under which the companies were operating.

The two decisions should certainly be of great benefit to all anthracite-producing companies, as it clearly indicates to them what they can and cannot do under this act. Now that the law is clearly defined for the first time, the companies can take courage and devote all their time and energies to developing their business, as every business organization is entitled to do. Their energies will be no longer diverted to defending their lives, and they will be saved the enormous expense entailed in that defense. This expense, too, it must be borne in mind, has been added to the price paid for coal by the consumer.

■

Slight Improvement in Coal Mining Business

The output of bituminous coal in the United States for the first six months of 1915 is estimated by C. E. Lesher, of the United States Geological Survey, to be between 180,000,000 and 190,000,000 short tons, the rate of production having been from 85 to 90 per cent. of the average for the previous year. Thus the bituminous coal production during this six-month period has been considerably less than for the corresponding period in 1914 and is little, if any, greater than the output during the last half of that year. The rate of production this year decreased after January, reached low ebb in March and April and is now increasing. The states west of the Mississippi River, which in 1914 produced less than 13 per cent. of the total, do not appear to have suffered from this decrease as much as the states east of it, reports from certain districts in the West showing an increase in the production over that of 1914.

This is attributed to the increase in metal mining and smelting and to greater railroad activity. In the East the loss of bunker trade on the Atlantic seaboard and the slowness of the lake season have been only partly offset by the increasing coal exports. The recent activity in the iron business has been slow to affect the coal trade, although coke has gained considerably during the last two months and for the rest of 1915 the increased output should continue.

The anthracite producers have fared better than the soft-coal operators, since it is estimated that the output of anthracite has fallen off only from 3 to 5 per cent. below the average for 1914.

Raising Mushrooms in a Coal Mine

BY THEODORE F. IMBACH*

SYNOPSIS—An interesting detailed description of a successful venture in mushroom cultivation. Many abandoned coal mines are ideal places to grow this table delicacy. There is a ready market for a large production.

The abandoned mine in which I first began growing mushrooms in 1911 is located in what is known as the Pittsburgh coal seam in Pennsylvania and West Virginia. The elevation of this seam above sea level at the mine referred to is about 1200 ft., or about 400 ft. above pool level in the Monongahela River at Morgantown. The "state farm" under which this mine has

sandstone (25 ft. or more in thickness) lying a few inches above the coal forms a substantial roof. The seam varies from 6 to 9 ft. in thickness.

The experiments here described were undertaken when I was employed as assistant horticulturist at the West Virginia University Agricultural Experiment Station. It was then I discovered that abandoned mines are well adapted to the growing of mushrooms. A large number of the rooms in mines have an even temperature the year round and in other respects are just right for growing mushrooms.

In selecting the places, get rooms not too wet. Do not lay beds on any floor that is liable to flood or places that have leakage or dripping overhead, and the room



A MUSHROOM BED IN ABANDONED WEST VIRGINIA COAL MINE

been worked is located about two miles northeast of Morgantown, bordering on the Morgantown and Uniontown pike. The mine was first opened up on the south end of the farm in 1845 by Joseph Ridgeway, and the coal was used mostly for domestic purposes.

From 1860 to 1890, when the use of natural gas was introduced into Morgantown, this coal was mined extensively and transported by wagon to many homes in Morgantown for heating purposes. The mine is so located that it has a natural drainage; the Pittsburgh

should have a temperature of about 55 deg. Next procure manure, which should never be any but fresh horse manure from stables where clean straw is used for bedding and horses have been grain-fed. Manure where hay or grass alone is fed seems to be of very little value to fertilize the ground in which mushrooms are grown.

Having the right kind of material, the next step is to get it into condition to make up your beds. You should have a fair-sized pile of manure in order that it may heat sufficiently and properly compost. Get your manure as near as possible at one time and keep it in one large pile 3 to 5 ft. high. Then begin turning thoroughly;

*Morgantown, W. Va.

shake each forkful and keep putting outside manure in the center. I turned manure between 15 and 20 times.

MANURE SHOULD BE TURNED

The reason for turning the manure so often is simply this: If it were used in a fresh state it would heat to such an extent, when made into beds, that it would burn. The chemicals which are contained in fresh horse manure must be reduced to some extent before they furnish just the proper nourishment for the growing of mushrooms. The manure is turned to reduce the heat so that the temperature can be controlled to moderate the chemicals and prevent the manure from later burning in the beds and running up a high temperature.

I maintained the proper amount of moisture by watering with a hose. Never allow manure to burn, or drown it by too much water. It was 20 days from the time I procured manure and began working it over until it was right to make up into beds. The straw was well broken up and had turned a dark brown while the manure was curing. In preparing the beds, do not make any of them less than 50 sq.ft.—the larger the better.

Face your beds with 12-in. boards set on edge; brace

mometer will run up from 105 to 140 deg. Take the temperature every day until it goes down to 75 or 80 deg., which will be 18 or 20 days after you make up the beds.

AFTER THE BEDS ARE READY

You are now ready to spawn, which should have been procured in advance from a reliable grower. Spawn should be as fresh as possible, but will keep six months if stored in a dry room at a temperature of 60 deg. If kept too moist it will start to grow spawn, or, to use the scientific name, mycelium, which corresponds to seed. There are two kinds of spawn—the English, called virgin spawn, and the American, called pure culture. I have always had best success from pure culture. It comes in bricks, which should be broken in six to eight pieces. Make holes in the bed 9 to 10 in. apart. I used a straight-pronged weeding fork with prongs 4 in. long. Make the holes on a slant. Put pieces of spawn in each hole, with end showing most life uppermost. It should be covered about one inch. Use brick or block to pound the manure back in place, always keeping the surface smooth and level. Watch the temperature and when it drops to 60 or 65 deg., which will take from 8 to 25 days,



MUSHROOMS IN BASKETS CONTAINING ONE POUND EACH READY TO BE MARKETED

well so they do not move out when transferring the manure inside. Make the beds so you can reach over them without getting on them after mushrooms begin growing. Put manure in in layers; tramp each layer well with your feet, or if the room is too low use a heavy block 12 in. square and two or three inches thick, with handle. Fill each bed up to the top of the boards, always keeping the surface even when building up. In putting on the last layer of manure use short manure, which is raked up after long manure has been hauled in. It will give a more even surface and you will not have straws sticking up after the bed is completed.

Each bed should be fairly wet, but not soggy; if too dry, water it, but be careful to water uniformly all over. It is easier to water a bed the second time than to get it too wet, which would cause you to make it over. After the bed has been made two or three days, procure a good hotbed thermometer and stick it into the bed for a depth of four inches about every 10 ft. The ther-

you will be ready for soiling, which consists of covering the bed with one inch of soil.

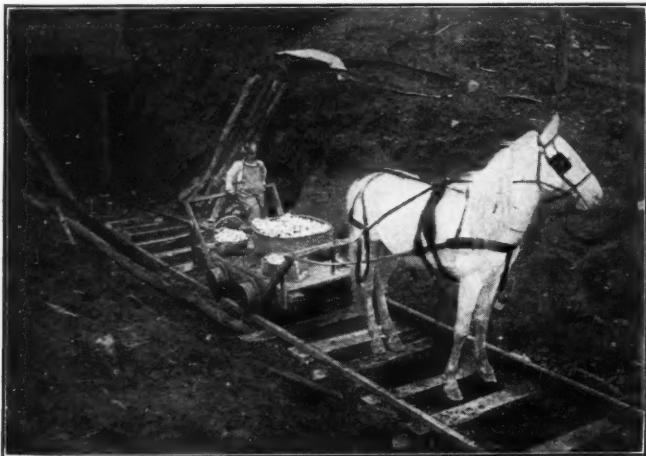
PUTTING SOIL ON THE BEDS

I used soil that had been composted for putting plants in greenhouses on about half of my beds, and on the rest ordinary garden soil, and the results were the same. Have soil moist, but not wet or sticky. Do not use a clay soil, as it will bake and crack on the beds. The soil should be screened to take out rocks and lumps. Use your pounder again to level the soil and get an even surface. If your bed becomes dry, water very lightly with fine spray or mist. I used a fruit spray pump for all watering after the beds were made up. Have the temperature of the water about 70 deg. Never drown the bed, but keep the walk moist and you will need but little water. My first mushrooms appeared in 39 days after spawning, and were in full bearing 26 days later, and continued to bear for three months.

From the time the beds begin to bear, go over them each day, gathering the mushrooms that are ready to pick. The best way to tell when they are ready is by picking all those where the frill connecting the cap or top has separated from the stem; or, better yet, just before this separation takes place. This makes the mushrooms better "keepers" and "shippers," for if they are picked when they are quite open or flat the under surface turns black quickly and makes them less desirable for the market.

It is the general impression that a mushroom springs up overnight. Just why this opinion has been formed I cannot say. There is really no reason why a mushroom should grow or develop more at night than during the daytime. The wild ones are usually gathered during the cool of the morning, before the warm weather affects them. This may be one reason why the impression is formed that they grow up overnight.

In cultivating mushrooms the conditions are also very different. The temperature and moisture conditions are more even, and I would say that under ordinary conditions it would take from two days to a week for a



MR. IMBACH'S SON HAULING MUSHROOMS FROM MINE WITH HIS PONY

mushroom to develop after it has grown above the ground. By this I mean that it takes somewhat longer for a large mushroom to reach its full growth than it does for a small one. Do not pull your mushrooms up or cut them off. In pulling them up you will surely disturb the roots or mycelium of those growing near the one gathered or those which as yet have not come up.

If you were to cut them off you would leave a stump which would decay and have a tendency to spoil the entire bed.

HOW TO GATHER MUSHROOMS

If the mushroom, which is ready to pick, is growing by itself, take hold of it by the cap and with a little twist separate it from the roots, while if it is in a clump with others not yet ready, hold the clump with one hand and twist out the one to be gathered. It is well to go over the beds every few days and with a little fresh soil fill the holes left by taking out the mushrooms, and at the same time remove any that show signs of decay by being disturbed. This will keep your beds clean and preserve an even surface.

The best way to gather your crop is to have two baskets, and as you twist out the mushrooms cut off the lower

part of the stem with the root attached and put it in one basket and the mushroom into the other. In this way the dirt adhering to the root will not be sprinkled over the mushrooms and they can be put on the packing table clean and free from dirt, while the stems and roots can be thrown out of doors and not in the paths, as I have seen done by careless growers.

Mushrooms were formerly marketed in baskets, but an attractive package helps to sell any article of food. A clean, white pasteboard box that will hold just a pound, I have found to be the best. Put your mushrooms on the market as soon after picking as possible. They will keep for two or three days, and they stand shipping well, as they do not break easily and need very little protection from the cold. They also retain in themselves a certain amount of heat, making them easy to handle even during cold weather. For local markets I used one- and two-quart berry boxes, which hold one and two pounds each.

My mushrooms were all graded, and I have found that it pays to separate them, putting the large, firm and perfect ones in one grade and the smaller ones, or button mushrooms, in another grade; and if by chance some have been overlooked in picking and become flat or open, I would advise putting them by themselves so as to keep the "number ones" and the "buttons" perfect.

A READY MARKET

Some people, who do not doubt but that they can grow mushrooms, fear that they will not be able to sell them. Such fears, however, are entirely groundless, for the demand is increasing yearly, and the fact that I received higher prices for mushrooms during late years than I did in any of the years previous is very good evidence that the demand is growing faster than the supply. In every community there are plenty of people who will gladly buy all you can raise, but who have been unable to get them, as the bulk of all the mushrooms grown in this country has so far been sent to a few large cities. In every city of any size you will find a good market for your crop; and if you will take the matter up with any commission man who deals in vegetables and fruits, he will be glad to handle all you can send him; and the same is true of large hotels and restaurants.

The essential things are good manure, fresh spawn and a good man. Never attempt to grow mushrooms with a careless man.

* * *

MOTOR TRUCKS ENLARGE AVAILABLE TERRITORY OF RETAILERS

On account of the extensive area of the city, the Philadelphia dealers are rapidly adopting the motor vehicle in order to facilitate deliveries. This increased use of the motor truck has brought about a peculiar condition. One large dealer who uses this method of delivery states that he does not know who his competitors are these days because dealers from far and wide are coming into his territory and seeking his trade.

Owing to the condition of the retail market no order is refused on account of a long haul. This is expected to adjust itself with the arrival of the busy days of fall and winter.

Storage of Powdered Coal

BY EDWARD J. KELLY*

Coal storage has become an important problem in modern industrial life because of the possible occurrence of sudden fluctuations in the market conditions and labor troubles at the mines or with transportation companies. Anthracite offers practically no difficulty in the way of storage, as it is almost unaffected by weather conditions and it will not ignite spontaneously. Bituminous coals, however, when stored, disintegrate and are in great danger of spontaneous ignition.

This is due to an absorption of oxygen from the atmosphere by the coal itself. If the heat resulting from this reaction can be dissipated, no harm results; otherwise the temperature of the coal rises until the temperature of ignition is reached. The area of the surface exposed is a determining factor, and since this surface area is increased as the size of the particles is decreased, we can readily imagine the importance of this when applied to powdered coal.

Dennstedt and Schaper in *Zangew. Chem.*, 25, 2625-9, show that the greater the percentage of oxygen in the coal, the more liable it is to ignite spontaneously.

Porter and Taylor in *J. Ind. Eng. Chem.*, 5, 292, state that "the development of heat on moistening dry coal . . . may contribute appreciably to the spontaneous heating of some coals in storage."

These opinions indicate two factors in the spontaneous ignition of powdered coal—the presence of oxygen and other occluded gases and the presence of moisture. Other causes of self-ignition are: 1. Pressure on the coal. 2. Presence of iron pyrites. 3. Volatile matter in the coal itself. 4. Temperature.

The effect of pressure is to increase the temperature of the pile of coal, and it varies as the height of the pile. It is suggested that the pile should never exceed a height of 12 ft.

The effect of iron pyrites is rather doubtful, as coals containing negligible quantities of this compound have been known to ignite spontaneously.

Coals which are fairly high in volatile matter are more subject to self-ignition. This has been fully borne out by the findings of Messrs. Tessenden and Wharton (*Bull. Univ. of Mo. Eng. Series*, Vol. 1, 1908).

The effect of temperature is considered by many authorities to be one of the important factors in spontaneous combustion, because the oxidation proceeds more rapidly as the temperature of the coal increases. Heat from the sun's rays may even be dangerous, an instance of this kind having occurred in the surface works of the Mayback colliery at Friedrichstahl, Germany. Floating coal dust deposited on some of the iron girders in layers of an inch or more, and was burned to a white ash when the girders became heated by the sun.

The following precautions should be observed in storing powdered coal: 1. Limit the height of the coal pile to 10 or 12 ft. 2. Isolate the coal from all sources of heat such as steam pipes, flues, reflecting surfaces and direct sunlight.

In regard to the conditions of storage, two different methods may be cited: 1. Storing in piles in the open air. 2. Storing in covered bins.

There seems to be very little to choose between these methods, save that all other things being equal, the covered bin would protect the coal from direct sunlight, which was shown to be a contributing factor in spontaneous ignition. If covered bins are used, added overhead charges will be entailed, while open storage on the other hand gives low costs.

I have been informed of a novel storage bin constructed for a firm in Maine. This bin contained several rows of upright beams. Saw-tooth projections were built on two sides of each upright, thereby forming air-spaces, which led into the main flue, the latter extending from the bottom of the bin to the top. When the bin was filled with coal, the heat generated and the gases given off escaped through the flues to the top of the bin and out into the air. It is perfectly obvious, however, that should the coal in the bin become ignited by any chance, the flues would produce a draft and so increase the rapidity of the combustion.

Bins should be constructed of stone, brick or concrete; if iron work has entered into the construction, it should be covered with concrete.

Alberta Law Regulating Plans

A new law was passed in Alberta Province, Canada, by order-in-council June 8, 1915, being a regulation under sec. 138 of the Mines Act, regarding plans. The new law is known as Order No. 4 and took effect July 1, 1915. It requires that all plans kept in accordance with the provisions of the Mines Act shall be made of durable material and prepared by or under the supervision of a person holding a certificate as mine surveyor granted under the Mines Act. The law prohibits any person not so qualified from preparing such a plan, although it permits the preparation of a plan by such person when acting under the supervision of one who has qualified.

The law further provides that any applicant for such certificate must satisfy the board of examiners in regard to the following points: 1. The applicant must have had at least two years' practical experience in the surveying of mines, or must hold a diploma in scientific and mining training obtained after a course of study of at least two years at an educational institute approved by the Minister of Mines, or have taken a degree in scientific and mining subjects at a university so approved. 2. The applicant must be competent (a) to make an accurate survey of the workings of a coal mine and to connect the same with a surface survey, (b) to make accurate levelings, (c) to plot accurately surveys and levelings; (d) the applicant must produce evidence of sobriety and general good conduct.

The law further provides that where the workings of a mine have approached within 2000 ft. of any borehole drilled for the purpose of developing natural gas or oil the owner, agent or manager of the mine shall keep in the office a correct plan of the mine drawn to the required scale and showing the position of said borehole in relation to the mine workings and the projected workings. A copy of this plan must be forwarded to the chief inspector of mines not later than Jan. 31 each year.

Each plan required by the Mines Act must bear the date of the last survey and the signature of the person making such survey or the signature of the certificated person under whose supervision the work has been done.

*Fuel engineering chemist, New York City Board of Estimate and Apportionment, 125 Worth St., New York City.

New Byproduct Coke Ovens in England

The Ebbw Vale Steel, Iron & Coal Co., Ltd., in Monmouthshire, England, has opened a modern plant for the production of 4000 tons of coke per week and the recovery of byproducts, which have hitherto been largely neglected in the district, says Consul L. A. Lathrop in *Commerce Reports*. The ovens are on the direct recovery system and were erected by the patentees, Messrs. Koppers, of Sheffield, England.

With the quality of coal mined by the company, it is expected to produce an excess of 9000 cu.ft. of gas per long ton of coal, from 5 to 6 gal. of tar, 20 lb. of sulphate of ammonia and from 15 to 16 cwt. (1 cwt. = 112 lb.) of coke. Further extensions of the plant will be made to recover benzol and toluol.

Extracts from a Superintendent's Diary

Every once in a while I am given opportunity to reap rich rewards in exchange for the prestige that is supposed to attach to my signature.

It may be a real-estate broker disposing of town lots or an insurance solicitor selling stock as well as policies in a new company, or a solicitor getting charter members for a burial association, or a wildcat bank, or what not—the programme is always the same. First they approach me and attempt to interest me in their scheme by presenting it strictly on its merits; failing in this, they drop vague hints about the possibility of my getting in on the ground floor; and still getting no encouragement, they throw caution to the winds and offer to take me in in payment for my influence.

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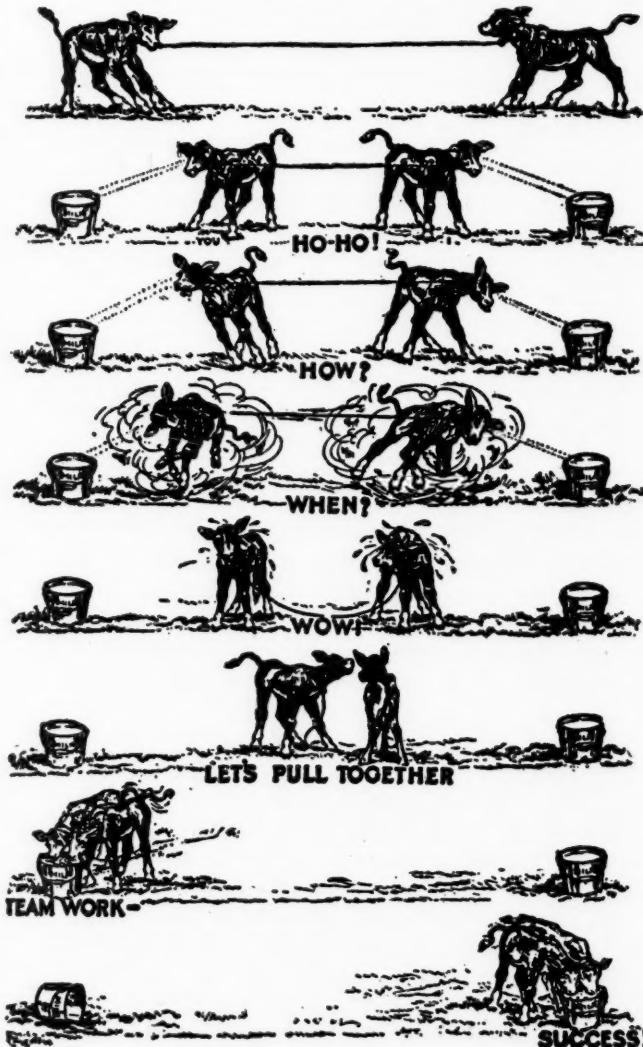
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But there is one who oft remains on duty, wearing nerves and brains, while others have their fun; the boss, who needs a layoff most, is toiling, toiling at his post, as constant as the sun. It would be better far for him, it would renew his strength and vim, if he would quit the grind, if he would drop his business chores, and chase himself around outdoors, and leave his cares behind.

The time invested in a rest is time invested for the best, for men who always toil, do so at sacrifice of power; their nerves get frayed, their tempers sour and sorcer than a boil. So for a little while forget the business with its care and fret, and be a youth once more; go fishing with a good long pole, take headers in the swimming-hole, slide down the cellar door.

A tonic it will prove to you; vitality it will renew, your grouch it will destroy; and when from woodlands picturesque you go back to your chair or desk, you'll find your work a joy. You have to take a rest at night, when in your bed you slumber tight, and snore some ragtime tunes; and if you knew not that repose, your usefulness full soon would close, your surname would be Prunes.

And if a little rest is good, a longer one, in field or wood, by grove or burbling stream, will help you as it helps your clerk, and brace you up and make your work no more a nightmare seem. So, Mr. Manager, be wise, get out and gambol 'neath the skies, and canter like a colt; get clear away from every care that brings the silver to your hair, from business jar and jolt. And take along to brook or glade the helpful paper of your trade, while you are resting there; thus you'll improve the leisure day, and drive all loneliness away, and have some truths to spare.

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New Byproduct Coke Ovens in England

The Ebbw Vale Steel, Iron & Coal Co., Ltd., in Monmouthshire, England, has opened a modern plant for the production of 4000 tons of coke per week and the recovery of byproducts, which have hitherto been largely neglected in the district, says Consul L. A. Lathrop in *Commerce Reports*. The ovens are on the direct recovery system and were erected by the patentees, Messrs. Kopfers, of Sheffield, England.

With the quality of coal mined by the company, it is expected to produce an excess of 9000 cu.ft. of gas per long ton of coal, from 5 to 6 gal. of tar, 20 lb. of sulphate of ammonia and from 15 to 16 cwt. (1 cwt. = 112 lb.) of coke. Further extensions of the plant will be made to recover benzol and toluol.

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Extracts from a Superintendent's Diary

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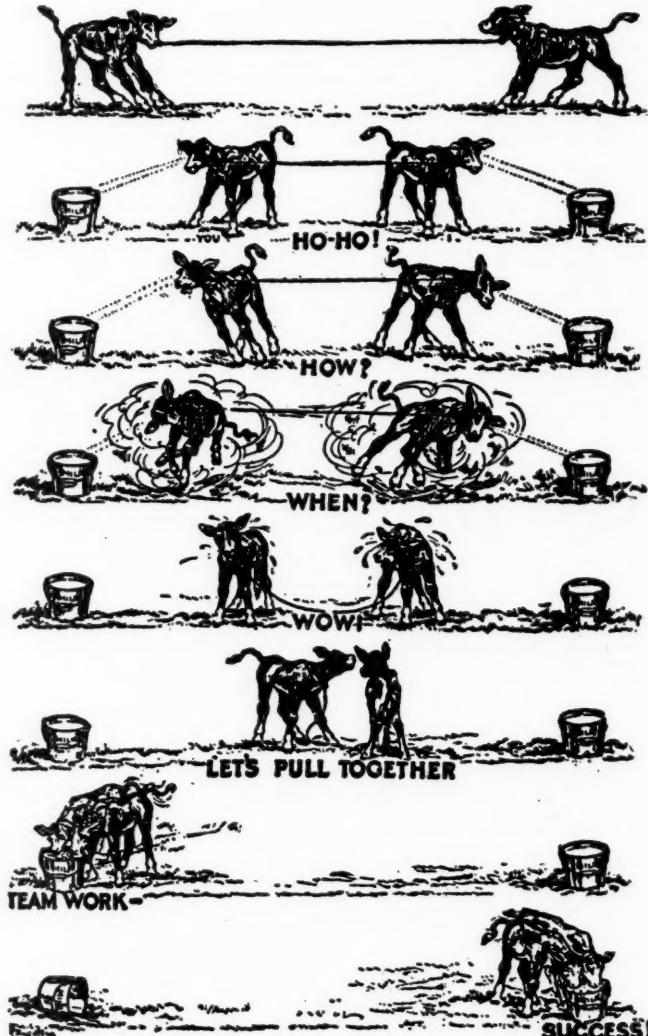
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The Labor Situation

SYNOPSIS—The scale committee in the anthracite district No. 1 has demanded the 8-hr. day, recognition of the union, a 25-per cent. increase in all day and contract wage rates, regardless of change in length of day, and also large allowances for overtime and holiday-time work. The Ohio miners are partly on strike and partly idle, and nearly all are destitute. The South Wales agreement is accepted by the miners.

The following is the report of the scale committee of district No. 1 of the United Mine Workers of America to the biennial convention, meeting in Scranton, Penn. The wording has been slightly changed, the principal modification being the omission of the unmannerly words "we demand" with which each clause opens with monotonous bad taste. We had occasion some time ago to publish an article by Milton H. Fies condemning the lack of manners in the operators' notices published around mining plants and recommending a more friendly manner of address.

The miners have no cause for complaint. They are no less arbitrary in writing their requirements. It is sure that it was not necessary for the miners to put "we demand" 21 times in a short document. They could have made their statement just as satisfactorily with the expression entirely left out, as in the abridgment we publish.

Scranton, Penn., July 19, 1915.

To the delegates of the first biennial convention: We, your scale committee, having examined all requests for an improved contract, submit for your approval the following demands:

1. Recognition of our organization with the right to negotiate a wage contract and to provide a satisfactory method for the collection of revenue for the organization.
2. An 8-hr. day for all men and boys employed in or around any colliery with no reduction in pay.

A New Conciliation Board Demanded

3. The Conciliation Board shall be abolished and the following method substituted for the adjustment of disputes: The employees of each mine through their grievance committee may form a general grievance committee, and the said committee shall appoint a subcommittee. Its duty shall be to carry on negotiations with representatives of the organization and officials of the company and try to arrive at a satisfactory agreement on any dispute which affects the employees in general. It shall also act in disagreements between the mine committee and the company officials, regarding new work or changed conditions, etc. Any agreement made by the subcommittee shall be effective and binding, and shall apply to all the employees working for that company.

All such agreements shall be made in writing, and signed by the officials of the company, the subcommittee and the representatives of the organization in behalf of the employees.

In case the subcommittee and the officials of the organization and company officials fail to come to an agreement on the dispute involved, the officials of the organization are to choose one man not interested in the dispute to arbitrate it. He shall hear all evidence, after which he shall make his decision within 30 days after the time at which it was decided that the organization officials and the representatives of the company had failed to reach a decision.

The said decision shall be final and binding on both parties to the controversy. The expense incurred shall be equally divided between the coal company and the mine workers. The expenses of the latter shall be paid by the district treasurer out of the funds of the district where the dispute arises.

4. An advance of 25 per cent. shall be made on all the rates now paid for day work. An increase of 25 per cent. shall be granted all contract miners and laborers.

5. Not more than two laborers shall be permitted to work under the care of any one miner.

6. Coal shall be weighed on the run-of-mine basis, 2240 lb. constituting a ton.

7. A uniform day at not less than \$4 per day shall be granted machine runners and \$3.50 per day shall be the rate for helpers.

8. Men in charge of a timbering, rockwork, or other like gang shall be paid the consideration miners' rate; helper

rates less than consideration of laborers' rate paid at the mines where this work is performed. [The real nature of this demand is not clear.]

9. The price of coal sold to employees shall not be increased during the life of the agreement. The price to be paid shall be specified when this contract is made.

10. Time and a half for all overtime and double time for Sunday work and holidays shall be conceded.

11. No employees shall be suspended or discharged until their suspension or dismissal has been considered. Such action shall be subject to revision similar to that accorded to any action under this contract.

12. A minimum rate for slate pickers shall be \$1.25; any advance received under this agreement shall be added thereto.

13. The manner in which mining machines shall be used shall be properly regulated, and a scale of wage rates for machine mining shall be granted, which shall be adjusted to the various systems of handling machine coal now in use in the anthracite region.

14. The contract system shall be abolished in the anthracite region, and all contracts now in effect shall be declared null and void after the signing of the new agreement.

15. A minimum rate of \$2.50 per 8-hr. day shall be paid to firemen, and the compensation to carpenters and blacksmiths shall be 47½c. per hr. To these rates should be added whatever general increase of wage other mine workers shall receive.

16. The next agreement shall be made for a period of two years.

Men Are To Be Paid for All the Props They Set

17. Payment shall be made for standing props on second mining.

18. Where three engineers are employed the third shall receive the same pay as the first two.

19. A payment of 10c. per ft. shall be made for the standing of all props on first mining.

20. Where the pitch does not exceed 30 deg., chambers shall not be driven more than 150 ft. long before being cut off by counter gangways. Where this cannot be done a payment of 20c. per car shall be made for the first 100 ft. from the platform, and 20c. extra shall be paid for every 50 ft. driven above the 50-ft. (?) mark. The same rule shall apply to buggy places.

21. No agreement shall be binding until first submitted to the local union for a referendum vote.

An Evident Expectation To Dicker Is Revealed

Despite the peremptory character of the demands, it is noticeable that there is a certain weakening about the wage concession, because a minimum is set for several workers and provision is made for these men receiving an equal increase with the other mine workers, whatever that may be.

There is, of course, no question but what the demand of the committee is merely a basis for dickering. The miners have not yet learned that they should ask for what they think they have a right to get and stick to it.

President John P. White is opposed to the recommendation which the scale committee has made relative to arbitration. He would like to see all matters brought before a single board for consideration, so that some uniformity would be obtained. He feels that otherwise local conditions may cause agreements to be made which will prejudice settlements in other districts where the conditions are slightly different.

The convention adopted a resolution which originated in local union No. 1649, which not only demands a fair compensation for machine mining, but charges that the operators have been driving the machine men to superhuman efforts in order that they might produce a large tonnage of coal which would serve to establish a basis which would be too high to be a fair criterion of what would constitute a day's work.

The miners, recognizing that there is a powerful press committee influencing the public in favor of the contentions of the operator, have decided to form a press bureau themselves. This committee will be named in each section and will distribute material to the papers and will provide matter for the "United Mine Worker's Journal."

Miners Object to Compensation Law

Not a little complaint was made at the convention about the Workmen's Compensation Law on the ground that a man who is injured so that he cannot work is not half but wholly incapacitated and should receive not merely half pay but 100 per cent. In fact, it is true, he has to meet, on the

whole, expenses which make it necessary for him to receive more pay rather than less in order to live as well as before.

Though he has nothing to pay for oil, carbide and powder, he has to meet in some cases doctor's, nurse's and drug-gist's bills, although in many instances part of these, for a while at least, is provided by the monthly payment to the doctor. The argument on the opposing side is, of course, that the miner should coinsure, so that he will not be anxious to claim help from the industry after he is fit to go back to work. Some miners, like some richer men who have insurance, are not prone to go to work if they can make as much by sitting at home.

The attorney for the Pennsylvania miners, defending his work in securing the passage of the law, declared: "You have the grandest employers' liability law ever written because it destroys two of the old common-law defenses—the fellow-servant rule and that of assumption of risk, and modifies a third, contributory negligence." The miners desire old-age mothers' pensions in addition to a more generous workmen's compensation law.

"Mild Request" for Replacing of Wood Rails

The Delaware & Hudson Co. was severely criticized in the convention at different times by the Eddy Creek local at Olyphant and by the Peckville miners. But more serious because more general was the complaint about room trackage. The miners want the wooden tracks alleged to be used in chambers of that company replaced by "iron rails." Certainly the miners in this present day have a right to have steel tracks in their rooms.

There is no profit to any company in using wood rails, as they have a short life and warp so freely that numbers have to be thrown out. The frequent derailments in the rooms prevent certainty in operation and are the cause of much lost time in the haulageways. It is quite likely, therefore, that if conditions prove as stated the men will get what they desire, and they cannot be blamed for their urgency in making their complaints. The resolution with commendable restraint calls for a "mild request" for steel rails.

Among other matters considered was the pay of presidents, secretaries, treasurers and district-board members. It is expected that the president's salary will be raised from \$1600 to \$2000 a year, the secretary-treasurer's from \$1300 to \$1500 and the district-board members will receive \$4 instead of \$3.85 a day.

There has been some opposition to the use of buttons as visible receipts of union dues, as they can be handed around among the men in a boarding-house. It has been decided that the regular district button must be used or none at all. Local unions cannot provide their own distinctive buttons.

The convention rejected a plan to set aside a "lockout fund" for the benefit of those who were temporarily discharged by coal companies or made idle by the closing of mines. It was suggested that 3c. out of every monthly per capita tax be used to establish this fund. The miners hope, however, to make the operators pay for idleness caused in this way and will not establish a fund for that purpose.

To Avoid Something Analogous to Colonization

The election for district officers has been bitterly contested, and many have been the charges of fraud. It has been alleged that a West Scranton local union purposely increased its contribution to union funds so as to obtain an excessive vote. In order to block such possible dishonesty, the rule relating to elections was made to read: "The tellers shall not count the votes of any union that has cast more votes than the number of members for which such local paid per capita tax to the district union for the three months preceding that in which the election is held. The local union shall send notice, upon uniform sheets supplied by the district, of all new members initiated during these months."

It is alleged that the vote of Local 2444 was illegal because the union was in arrears, that Local 1635 turned in 167 votes, although only 9 members voted, while Local 1068, where only 8 members voted, was registered by the union solidly for the administration. Other examples quoted are these: Local 1001 cast 72 votes and the returns show 521. Local 957 cast 402 votes for Thomas Hilton as executive-board member and 6 for his opponent, Peter O'Donnell. The tellers' report neatly reversed the figures in O'Donnell's favor. The vote was close for this office, for O'Donnell received 6737 and Hilton 5842.

The Votes in District No. 1 Show Dempsey President

John T. Dempsey, of Scranton, is re-elected president with 20,666 votes, beating Thomas Morris, of Edwardsville, who received only 11,081. Joseph Yannis, of Pittston, who faced as many as five rivals, easily won as vice-president with only 12,232 votes. John M. Mack, with 21,246½ votes, beat his only rival, Enoch Williams, of Taylor, who polled only 996½ votes. He was running for the secretary-treasurership. Thomas

Davis, of Nanticoke, again becomes international-board member, more than doubling, with his 20,737 votes, the vote given to his rival, George Brown, of Scranton.

John P. White is receiving an enthusiastic welcome in the anthracite region, though his success in securing members has yet to be proved. He has issued a striking statement on the recent financial record of the Delaware, Lackawanna & Western R.R. Co.'s Coal Department, which a few days ago declared a deferred dividend of 60 per cent.

He declares in his statement that dividends totaling 140 per cent. have been paid in 6 years, that on a capital stock of \$5,590,000 dividends of \$9,226,000 have been paid, "which gives to the stockholders the return of their original investment and \$2,636,000 in addition. The stock is still theirs, and it is conceded by all that the holdings of the company, without considering the increased valuation accruing from the large dividends paid, has greatly increased in value. The fact is the Delaware, Lackawanna & Western has outdistanced all other operating companies in building for future opportunities."

As Mr. White here suggests, the Delaware, Lackawanna & Western R.R. Co.'s Coal Department has an advantage over nearly all the other coal companies, for their affairs are by no means so prosperous. He has taken the "Henry Ford" company of them all. But he does not stop at this point; he goes on to show what this means to each employee.

If the Lackawanna Dividends Had Gone to the Employees

There are 19,056 of these men, and if the surplus over 10 per cent. per annum had been paid them, each individual would have received \$45.23 per year more, and each man or boy would have been paid 19c. more per day. All this could have been done without disturbing the surplus of \$1,500,000. This 19c. per day, he declares, would have been a 10 per cent. increase were all classes lumped together as a unit.

This richest company is taken as a guide to show what all the companies could do. The mine workers, however, are not satisfied with 10 per cent., but desire 25 per cent. of an increase and also for the day men a decrease of time of 11 per cent. It is remarkable how the argument breaks down at this point.

Mr. White would have the poor educated as well as the rich, and pleads eloquently for it. That alone is not by any means impossible, but when poor and rich share alike no one will experience any great degree of affluence, for, as has been shown, the income above 10 per cent. of the best anthracite company would only give 19c. per day per man if divided and the whole income for 6 years not more than 33c. Dividends grow small when divided among the multitude.

But though John P. White makes a somewhat biased statement about the Delaware, Lackawanna & Western R.R. and other anthracite companies, he is not lacking in the gentle amenities of life. And in their turn the companies are not being ungenerous. At Edwardsville the Kingston Coal Co., one of the independents, without charge furnished the current and paid the electricians to wire the field when Mr. White came to that town to promote the interests of the union.

Are Not the Miners in Eastern Ohio Justified?

About 1000 miners are on strike in eastern Ohio, and there has been a disposition to blame them. The public remembers that within the last two years they have been on strike for 13 months and business has been so bad that only a few of them have gone back to work. On its face, this public disapproval seems to be merited, but the miners are not without reasonable excuse. In fact they are showing an excellent disposition in the matter.

Though it is not in the contract, the operators are said to have agreed that by July 22 they would install mine scales, so as to weigh the coal as it came from the mine. This gave them over 60 days to do the work for the contract dates from May 11. Only about 10 places out of 69 have made the necessary changes and some of the mines are said to have made no attempt to do so. This statement has been made of Pultney No. 1, Fort Pitt, the Webb, the Bakerswell, the Neff and the Franklin mine. Scales are already installed at Rail & River No. 1, and they are being erected at Rail & River Nos. 2 and 6.

C. J. Albasin, the president of subdistrict No. 5, which covers eastern Ohio, declares that where attempts are being made to secure and install scales, the union is endeavoring to keep the men at work and is extending the time for the necessary changes. The operators claim the scale makers are unable to fill the orders promptly. The Lorain Coal & Dock Co.'s mine at Blaine, the Herrick mine of the United States Coal Co. at Rush Run and the Cambria Mining Co. at Bellaire are closed down as a result of the lack of facilities for weighing coal as it comes from the mine.

It is stated by C. J. Albasin that during the recent strike \$1,654,450 was paid out by the union for food, clothing and

medicine. Of course, the miners also received direct contributions, and their losses are by no means adequately represented by the sum expended in their relief.

But with the closing of the mines in the Hocking district a further accession has been made to the sorrows of the Ohio miners, and on July 22 Governor Willis made an appeal for help for those in both the eastern and southern ends of the coal region. The Adjutant General, B. W. Hough, will distribute the relief.

The miners are convinced that it is not so much the Green bill and the contract calling for payment for all coal mined, whether large or small, which are paralyzing the industry. In fact, when the Gallagher amendment to the Green bill was being pressed the miners urged that its passage would make little or no change in the condition of the business, whereas the Vorhies bill for fair railroad rates was the measure most greatly to be desired. They are now urging that some West Virginia coal is traveling 200 miles for a freight rate of 85c., while some Ohio coal goes one-quarter as far, 50 miles, for 5c. less. The railroads contend as a reason, though they can hardly claim it as a conclusive argument, that the West Virginia coal in the case cited is delivered to them in train-load lots at Armitage and, therefore, there is no extra expense in assembling the cars from the mines.

The United Mine Workers of America, District 6, which covers the Hocking Valley district, has made complaint about this discrimination to the State Utilities Commission through George B. Okey, its attorney. All the 39 railroads operating in Ohio are the defendants.

Tom Lewis to Be Operators' Representative

It is rumored that T. L. Lewis, the former president of the United Mine Workers of America, is likely to succeed John Zelenka as secretary of the Ohio Coal Operators' Association. T. L. Lewis has for some time published a coal paper at Bridgeport, Ohio. He has been extremely active in the eastern Ohio strike and has taken a position not unpleasing to the operators and consequently has more or less offended the miners. But he is a strong advocate of the union and his ability as a speaker and organizer is unquestioned.

The High Compensation Rates in West Virginia

The union miners in the Kanawha district are combining with the operators in opposition to the flat premium rate of \$2.25 fixed on the coal industry of West Virginia by the Workmen's Compensation Law. The miners claim their share will be \$1 per capita. They feel that the Kanawha district should not pay for the deficit caused by explosions in other districts. Carried to its conclusions, this argument would lead to each mine paying for its own explosions. The distribution of the burden through the industry is what assures certainty in the operation of the compensation law.

Attempts Are Made to Organize Eastern Kentucky

The miners of the Continental Coal Corporation and the new Bell Jellico Coal Co. have gone back to work at the same schedule of wages as prevailed when they walked out. The Continental Coal Corporation has agreed to restore the 10 per cent deducted from the wage scale, on Oct. 1 or sooner if conditions warrant it. The company agrees to sell goods from the commissary on a 16 per cent. profit and to make certain repairs on the men's homes.

A local union was organized and an attempt will unquestionably be made to introduce the organization of the United Mine Workers of America into that unorganized field. At other mines the men are expecting to organize shortly, and the employees of the Coleman Mining Co. and the Pioneer Mining Co. in the Straight Creek field expect to demand recognition. But the lack of funds is likely at present to prevent successful organization, and the action will probably be delayed till a period of prosperity succeeds the present depression.

Amalgamation with Western Federation of Miners

Frank Farrington, president of District No. 12 of the United Mine Workers of America, announces that plans are being considered, as provided at the Indianapolis convention, for the amalgamation of the Western Federation of Miners with the United Mine Workers of America. Committees of the two organizations are to confer July 27 at Butte, Mont. The Western Federation of Miners is now opposed by a rival union at Butte, which is stronger than the Federation, and the latter organization has been discredited everywhere and to "wish on" the U. M. W. of A. such an "Old Man of the Sea" would be a most unkindly act.

The Courts May Act in the Bache-Denman Case

"Coal Age" is informed that in Arkansas the federal court did not dismiss the case of the Bache-Denman Coal Co., but merely sustained a demurrer, filed by the defendant. The company will amend its complaint and feels that as revised

it meets all the points which were raised against the plaintiff company in the demurrer of the defendant.

South Wales Strike at an End

The strike in South Wales was definitely ended on Wednesday, July 21, when the miners agreed to the terms accepted by their leaders on the previous day. Lloyd George made a rousing speech to his friends, the miners, on the preceding day and asked the men to make up for the lost time by "extraordinary efforts."

All through the South Wales dispute the Federation of Miners of the United Kingdom has stood for peace and arbitration. It is not clear why the Federation showed more patriotism than the South Wales mine workers, but this is possibly due to several causes, among others the fact that the war has come more closely home to the dwellers in Yorkshire and the North country, and because the English are less sensitive under restraint than the Welsh. It is certain that in Wales the talk about the use of the strike to stop the war has been most rife, and it has had not a little to do with the present unrest.

But in no part of the country is there less cause for striking, unless indeed high pay acts as an incentive to do so. The South Wales miners have been receiving higher pay than the miners in other sections, for owing to the comparative newness of the South Wales field and the excellence of its product its advance has been rapid and prices have been high, and in a large degree the miners have participated.

Miners Felt They Had a Valid Grievance

The miners' wages had increased since July 1, 1914. At that time they were 60 per cent. above the base established in 1879. Just a year later they were 77½ per cent. above that base or had been raised 10.9 per cent. Probably the increase was no more than the increase in cost of living. Perhaps, also, where some of the wage earners were in the trenches, those that remained had a larger burden to sustain. From this point of view it is hard to deny that they had a grievance that an arbitration board, such as was proposed, would have recognized.

Moreover, while the miners' rate of wages had increased nearly 11 per cent., the operators are receiving a far larger percentage increase. On July 1, 1914, the price of best Welsh small steam coal, f.o.b. Cardiff, was \$2.67 per ton. A year later it was selling for from \$4.75 to \$4.87, an increase of from 77 to 82 per cent. No. 3 Rhondda, lump, has risen from \$4.25 to \$6.80, a rise of 60 per cent. The operators are entitled to a slightly higher raise in price than the miners, because of the large increase in the cost of props; but it would have shown greater patriotism had they declared that no matter what others did they would raise their prices not one penny higher than was necessary to maintain their regular profits.

During an international war is no time to be trying to become rich at the expense of one's countrymen and allies. Had prices been unchanged wages might have been kept down to the ruling figure without any evidence of injustice. It is hard when declaring the South Wales miners unpatriotic not to extend that aspersion to the operators, who should have known better.

The government is preparing to limit profits to an even dollar above pre-bellum prices. That is an increase of from 25 to 30 per cent., hardly more than the miners will now receive under the new arrangement.

What the Operators Plead in Extension

It is true that the rise in the price of the coal reserved for Admiralty use has not been as large as that of other coal, still that price has risen from \$5.10 and \$5.22 to \$6.56, a rise of from 26 to 29 per cent. Moreover, the operator urges that the rise in price has not persisted all through the war. The prices were hardly any higher when the year commenced than six months before, and business had not been by any means good.

The operators are but human and the prospect of a 25-per cent. income tax may have spurred them on to enlarge their profits; and to their credit be it said, there have been some other concerns which, like the ocean freighters, have increased their prices not 70 but 200 per cent.

Moreover it is only by profits that the large costs of the war can be met. What is made and spent is gone forever. The profits can be seized by the government by taxation and made to serve the nation, but the money paid as wages will be spread so thin over a large area that the tax collector will be grasping at thin air. In fact, the British have long since ceased to tax anything the poor man consumes except beer, whiskey, tobacco, tea, coffee and currants and the exchequer derives all its income from profits in the form of income tax.

The miners claim with truth that the profits in the Welsh coal trade have always been ample, and they feel that there is no excuse for such large advances as have been made since the war.

Editorials

New Head for Mining Bureau

It is generally accepted as a good policy in modern business to seek men for high positions from employees who have rendered faithful and efficient service in minor capacities. Everyone knows that a man will work with better heart when there is hope of reaching the top in his chosen line of endeavor. The knowledge that such a policy or principle of selection exists will bring the best talent to a corporation and will retain this talent through years of earnest effort. What applies to an industrial concern applies equally to a Government bureau.

The coal-mining fraternity, in fact mining men everywhere, are hoping that in selecting someone to succeed Dr. Holmes as director of the U. S. Bureau of Mines President Wilson will choose a man qualified by service in the bureau, or through long experience in mining engineering work elsewhere.

The coal and metal industries will support a new director whole-heartedly if the man chosen is selected for his evident ability to serve efficiently as head of the mining bureau. The work so ably started and carried on by Dr. Holmes will be severely crippled if political pull constitutes the essential qualification in the matter of selection.

Mining men are anxious and we trust current reports of an abhorrent choice are unfounded.

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Recent Anthracite Decisions

The recent court decisions relating to the anthracite companies should bring a feeling of relief to all concerned, for the reasons that are outlined at greater length on another page of this issue of *Coal Age*. These companies have never been intentional violators of the law and were only acting under the statutes of the State of Pennsylvania. So their acts were valid enough until the state laws under which they had operated were rendered void by the passage of a national act.

These continued suits have aroused the feeling of the general public against the coal companies. Much of this feeling was not by any means spontaneous, but has been created by irresponsible parties pandering to the petty prejudices of people who allow others to think for them.

We may now hope that the coal companies can go forward and attend strictly to business and may be able to show a profit to their stockholders which will be commensurate with the capital invested. Some of the anthracite companies have made fair profits; in fact, the returns to some of them have been quite large, but it can be safely asserted that they nowhere approach those made in a dozen other business enterprises in this country which return large dividends year after year without any comment from the people.

It seems to be a weakness of human nature to decry the cost of vital necessities, whatever the price may be, yet a man can make a fortune in an amusement enterprise by

the simple device of doubling the price, with only a gentle murmur on the part of the public, which continues its patronage and forgets. The consumers will make an automobile manufacturer a millionaire several times over and be actually greedy to purchase his product, the only question as to price being whether they have it or not.

Let us hope that a new day with at least 6 per cent. sunshine is dawning for the coal man. He has had so many trials and tribulations that it won't take much to make him happy and contented.

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A Memorial for Dr. Holmes

It seems to be the unanimous opinion of the personal friends of Dr. Holmes, late director of the U. S. Bureau of Mines, that there should be some permanent memorial for a man so big of heart, so earnest and efficient as he was. At a recent gathering of a large number of his friends two plans were suggested which seemed to meet general approval. The first was the erection of an appropriate monument at the grave in Rock Creek Cemetery, Washington; the second plan was that a memorial volume should be printed, the book to contain a sketch of Dr. Holmes' life, views of his work by a number of selected persons, resolutions of various societies and associations, and finally a number of writings and addresses by Dr. Holmes himself.

There is no doubt but that either of these plans would be widely supported by the great army of workers in the mining and metallurgical industries. Few men, especially in the coal mines, but have felt the beneficial effects of the work carried on by the Federal mining bureau since its inauguration under the direction of Dr. Holmes. All of these men would gladly contribute the small amounts needed from each individual for either of the memorials above referred to.

Coal Age would greatly appreciate expressions of opinion on this matter from those of its readers who have numbered themselves among the host of coal-mining people who have at one time or another associated or coöperated with Dr. Holmes in the advancement of the important work he undertook. Such suggestions as we receive are not necessarily intended for publication, but for the guidance of those of Dr. Holmes' friends who will assume the responsibility and initiate the movement for a fitting memorial to honor the man and perpetuate his work.

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The United Mine Workers

The plea of Mr. Archbald for the recognition of the union in last week's issue has of course the right ring. It does seem right that the men should be represented, and because some of the leaders are irresponsible seems an inadequate reason for condemning the whole union.

But the operator who has no organization to take exception to his every move is naturally disposed to avoid

raising such a spirit of unrest, for he knows that the genii of the bottle when freed is quite as apt to be unreasonable as to be fair. He may feel admirably friendly to all the purposes of the union and yet be greatly disinclined to risk the peace around his mine by permitting the establishment of the union.

He argues: "The men say I have frailties against which they must be protected. I probably have them, but so have they, and it is best for me to run my own business." And he is surely not wrong in viewing several of the miners' leaders, especially in grievance committees, as the very epitome of revolt.

It is strange how fortunate the union has been in its national leaders and how unfortunate it has been in selecting its more local officers. One would expect that the national leaders, being selected by men who cannot know them, would be chosen without judgment and would be entirely unworthy of their places of honor. On the other hand, the grievance committee, which is well known to all the voters, should represent the real spirit of the men and be composed of the most rational fellows. But that is rarely the case. The bigger leaders are more responsible than those in places of local prominence and are in most cases men of solid worth. But your grievance committee is ever a standing offense.

The same is true in the affairs of our country. We have good reason to be proud of our Presidents, but our state officers and city aldermen are often a burden grievous to be borne.

The U. M. W. of A. is not without its excellent qualities. Some one might without sophistry write a panegyric on its solidarity. It has steadily refused to make any choice between the various classes in its membership. Roadmen and miners, carpenters and motormen, doorboys and timbermen are alike recipients of its solicitude. Nor does it allow squabbles between them. The miner who is called off to put up a brattice is not reprimanded because he takes the place of an absent carpenter; the carpenter who sets a prop for a doorway does not start a strike of timbermen; the miner who bails a little water does not find himself scolded by the pumper. There is nothing in mining like the squabbles among the house builders or the fusses recently disturbing the Remington arms plant.

The union once well established is better than when partly organized. The first men who join are the soreheads whom nothing suits, who do not believe in the present order of things; many are of the belief that they should not have to work for a living. They are men who like to lead, and trouble is in the wind.

It is not strange then that when the companies are once committed to a 50-per cent. union they change their views. They want to deal with all their workingmen not with the soreheads only. They desire to meet a consensus, not a travesty, of opinion, and they begin to look forward to a time when every man will be in the union, when every man will attend meetings and vote and when the vote will go to the best man. They have the same ideals as should animate our political life.

The best thing about Mr. Archbald's article is the reference to the need for the open discussion of every labor problem. Some day the operator will be permitted to meet the union in council and argue his case. He will have a chance to face his men and tell his story.

The future will find us all knowing something of the arguments of the other side and basing our attitude upon them. The miner and the operator now plot darkly and in silence, and they come together only in clashes.

The miners' leaders have been talking loudly about the present war. It is, they say, a crime of the chancelleries, and in some ways they may be right. But why do not the miners themselves abolish their chancelleries? Why do they deny the operator the right to state his arguments in union meetings? Why must he always meet only their leaders, their chancellors, and not the men themselves?

Perhaps, as has been said in condemning statesmen, the miners' leaders are partly right. If the people could have met and talked the matter over man to man the war would perhaps have never happened, and probably if the same had been done in disputes between employer and employee many a strike war would have been averted. But the military men in the one case and the labor leaders in the other would have been disappointed and their trade would have been ignored.

The popular will would have been supreme and the men would not have blindly followed courses which appealed to them merely because they never had heard the opposing point of view. When also the leaders no longer fear the whole truth the *United Mine Workers' Journal* will no longer be the painfully newsless and unfair sheet it now is, but will let real light in on the causes of conflict and paint a real picture in which all is not shadow.

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When Opportunity Knocks

All of us have been told from the time of our early childhood that Opportunity knocks at every man's door at some time or other and that each individual must be ever alert and responsive to the call. The coal industry is a business of great magnitude. Several thousand intelligent and experienced men are required to fill the important positions connected with the production of coal. Right now a number of large operating companies are searching for men who are qualified to fill positions of trust and responsibility.

A few days ago the manager of one of the largest bituminous operations in America asked us to recommend a man qualified to report on a peculiar problem that arose in connection with the operation of one of its mines. We remembered that a certain superintendent had recently prepared a paper covering in a general way the problem that confronted the bituminous operator above mentioned. There was a quick exchange of telegrams, and the author of the article was engaged to investigate the conditions and report a remedy.

This case is not an isolated one, for similar requests come to us at frequent intervals. What we want to emphasize is the desirability and advisability of mining men writing detailed accounts of their experiences, for it is only through such dissemination of practical information that great advances in the art of mining can be brought about. There is no doubt that what benefits the coal industry as a whole benefits also every individual engaged therein. It is likewise true that the greatest reputations attained by mining men have had their beginning founded on early literary efforts, which have brought them more than a purely local renown and focused attention on their practical sense, experience and ability.

Sociological Department

Kansas City First-Aid Contest

SYNOPSIS—A meet of first-aid workers at Kansas City, Mo., in which the miners from five states and their union were the chief factors, was held on July 10. The winning team, which is that from Lehigh, Okla., will go to San Francisco to represent Oklahoma, Kansas, Iowa, Missouri, Arkansas and Texas. The good work of the mining teams has started the first-aid movement in factories and in the police department of Kansas City.

One of the bright spots in the character of Dr. J. A. Holmes, the recently deceased chief of the Bureau of Mines, was the breadth with which he discerned that the first-aid movement is not an interest solely of the operator and of the men he might delegate, but of all workingmen, individually and in association. As a result of his work and that of his associates—one of whom, W. D. Ryan, is a former labor leader—the miners and the union have taken up first-aid training and contests and in many places are doing the work as their own, but with the friendly coöperation of the operators.

This is emphatically constructive unionism and demonstrates the fact that the union is organized for the welfare of the miner rather than for the perdition of the operator.

A first-aid contest and mine-rescue demonstration was held at Kansas City, Mo., July 10, under the patronage of the Public Safety Commercial Club of Kansas City, the Southwestern Interstate Coal Operators Association, the United Mine Workers of America and the United States Bureau of Mines.

The meet was held in the convention hall at 8 p.m., and about 2500 persons attended. Perhaps no meet of this sort outside Pittsburgh has been witnessed by so many people.

The committee on arrangements included also E. M. Clendening, secretary of the Kansas City Commercial Club; M. F. Ryan, president of the Brotherhood of Carmen; John T. Smith, business agent of the Industrial Council of Kansas City, Mo., who also represented the Missouri branch of the American Federation of Labor, and E. R. Sweeney, vice-president and general manager of the Gray-Bryan-Sweeney Coal Co., a member of the operators' association and also an active member of the Commercial Club.

The doctors who examined the dressings and action of the teams were C. C. Nesselrode from Kansas City, Kan., across the Kansas River; B. H. Zwart, P. F. Bohn, M. J. Owens, R. M. Meade, R. M. Schaufler, Logan Clendening and F. J. Ridge, all of Kansas City, Mo.

Many Labor Leaders Present

To show the general interest in the meet, a list of those participating from outside the city may well be recited: George McBride, state labor commissioner of Kansas from Topeka, Kan.; P. H. Waterman, vice-president of the Iowa Coal Operators Association; W. H. Rogers, president, and John Gray, secretary, of the United Mine Workers of Iowa; George Hill, chief inspector of Missouri; Grant Parker, president, and George Heppel, secretary, of the United Mine Workers of Missouri; A. W. Dickenson, superintendent of the Central Coal & Coke Co.; Joseph Fletcher, general manager of the Cherokee & Pittsburgh Coal Mining Co., of Pittsburg, Kan., and vice-president of the American Mine Safety Association; John Pellegrino, mine inspector of Kansas; Bernard Harrigan, president of the United Mine Workers of Kansas; George Richardson, assistant commissioner of the Coal Operators Association of Kansas, and D. C. McAlpine, of Lehigh, Okla. The large number of labor leaders present may be noted with satisfaction.

The event was primarily a contest in first-aid work among teams from five states—Arkansas, Iowa, Kansas, Missouri and Oklahoma. The winning team was to be awarded the honor of representing the district at a contest in San Fran-

cisco. When it was proposed to hold the meet in Kansas City members of the operators' association who were also members of the Commercial Club realized that the coöperation of that institution would assist the safety-first movement and give wider publicity to the first-aid work now being done at mines.

How Funds for Contest Were Raised

The project was put in the hands of the Public Safety Committee of the club, and W. T. Grant, who is secretary of the Business Men's Accident Association of America, was made general chairman. The committee sold the manufacturers about 100 boxes in the convention hall and thus raised funds for the event. The manufacturers either used the box seats themselves or gave them to employees. About 10,000 tickets of admission were distributed by the committee among industrial employers, chiefly as formal notices of the meeting. General admission, however, was free.

About 2500 spectators attended the meet, though the night was hot and the general inclination was naturally to seek the parks and to stay outdoors. In the audience there were about as many women as men, and a large number of boys. It was notable that most of the men from industrial plants brought their wives and sons, and many their daughters also. The presence of the women and children was welcomed, as by their efforts safety-first and first-aid propaganda can be made to grow most rapidly.

Manufacturers Follow Lead of Miners

By special invitation the fire department of the city was also liberally represented. It had been specially announced that while the miners would demonstrate first-aid work as conducted at mines, the procedure would be similar to that in force at industrial plants and, indeed, wherever accidents occur.

As the object of the event was partly the promotion of safety-first propaganda, a few short speeches were made before the contest commenced. W. T. Grant, who introduced the speakers, reviewed the efforts made by large corporations to prevent accidents. He called attention to the large financial savings thereby accruing and to the loss of efficiency resulting from losing the services of men injured. He showed that the employed gained even more by saving their limbs and fingers, and even their lives in some instances.

Mayor Henry Jost of Kansas City declared that cities should be as careful to protect the citizens from accidents and from the ill effects of poorly treated injuries as it is to assure them safety from disease and rapid recovery from infection. These latter needs are now supplied by the work of boards of health, and in time we will learn to have an equal municipal regard for defense against accidents and their sequelæ. Senator James A. Reed declared that the police of the city could well go to school to the miners. Though the miners are the better trained, no one is called so often to the scene of an accident as the policeman, and he is usually as little prepared to give first-aid treatment as the ordinary citizen.

Rabid Remarks on Negligence

Senator Reed urged, with little reason, that one outcome of the present movement would probably be the establishment of the principle that an employer who allowed conditions under which fatal accident resulted would be regarded as guilty of criminal homicide. There is once in a while a demand that negligence shall be treated as severely as intention, but the public will continue to have more sense than such hotheaded law makers. No one is going to hang a miner for failing to close a door, much less an employer for having failed to see that some other miner or other employee closed it.

The miners, coal operators and others who promoted the event may be congratulated on the probable immediate outcome of the event, for a branch of the National Safety Council is to be organized in Kansas City, which will begin work with the eager coöperation of a majority of the manufacturers and men.

The contest was divided as usual into events for one and two men and for teams. The result, scoring by the table

approved by the American Mine Safety Association, was as follows:

Oklahoma team from Lehigh, Okla., 888; Kansas team from Frontenac, Kan., 883; Iowa team from Hocking, Iowa, 843; Missouri team from Bevier, Mo., 823; Arkansas team from Calhoun, Okla., 822. A sixth team, of men appointed from among the visitors in the hall when the contest opened, took the place of the Texas team from Thurber, Tex., that did not appear. It scored 824.

Dangers of Mine in Dumb Show

Following the contest a demonstration of actual rescue work was staged. At one end of the hall a shed was erected about 5 ft. high, having low windows under the eaves except for about 12 ft. at one end. This represented a miniature mine. Inspectors examined the workings and reported gas in one chamber. There was a drunken miner with a pipe, an altercation, an entrance of the gas which filled the chamber and an explosion that filled the hall with smoke. A miner was projected through the tar-paper walls, apparently unconscious. The rescue teams rushed to the mine, and an automobile, filled with miners wearing breathing apparatus, dashed quickly into the hall. These rescuers dragged out the men caught in the explosion.

The rescue car from Pittsburg, Kan., No. 4, had been stationed for several days on a downtown switch track, and was visited by several thousand persons. After the meet this car returned to Pittsburg.



Meeting of Utah Fuel Co. Officials

At a recent meeting of the superintendents of the Utah Fuel Co. the subject considered was the education of foreigners. As the matter discussed was not of a technical nature but one of wide human interest, the meeting was largely an open one; consequently not only the superintendents, but the engineers, railroad men, mechanics, a veterinary surgeon and several mine and outside foremen, 18 in all, were invited and were present.

For the benefit of the visitors it was explained that the company had just made arrangements with the public schools in its various mining camps to give instruction in the rudiments of English, in American citizenship, sanitation and mining methods to all foreigners lacking a knowledge of the English language and American customs. The courses of instruction will follow closely those employed by similar institutions in the East, and motion pictures will be employed to illustrate the matters under consideration.

The need for this work is apparent to all those in charge of workmen; for of the more than 2000 men employed by the Utah Fuel Co., only 31.3 per cent. speak English, including Americans, white and colored, and British. Germans, Finns, Swedes, Austrians, French, Italians, Greeks, Japanese and Mexicans comprise the remainder, or 68.7 per cent. of the total. Of these 89.4 per cent. are Austrians, Italians and Greeks. A large percentage of these men can neither read nor write English, and understand it but little when it is spoken. They come to the mines with no knowledge of coal mining.

Many of these men, especially the middle-aged, have come to America solely with the intention of working just long and hard enough to save sufficient money to permit them to return to the homeland and live in comparative comfort for the remainder of their lives. It was the opinion of the meeting that there was only a small chance to educate such men and change their standards of life.

However, as a matter of safety for the majority of men in the mines, and as a means of rendering the work of the various foremen in charge of them less burden-

some, the members of the council thought that no non-English-speaking man should be employed unless he would agree to take the course of instruction.

It was thought that the work should be concentrated largely on the young and ambitious and those who come to America as the land of promise and equal opportunities, for it was felt that greater success could be achieved with them. It was the consensus of opinion that special efforts should be made to instruct men in the fundamentals of mining and in methods of taking care of themselves and making their working places safe. The engineers in the meeting, speaking true to form, suggested that men be instructed how to obtain the greatest and best results with the least expenditure of labor and material.

It was recalled that when times were good and labor scarce great numbers of foreigners were employed, many of whom were not only ignorant of the way to mine coal but could scarcely make intelligible signs. Imagine the work of the poor foreman who had to maintain the output with such men.

Formerly all the drivers were Americans or British; now a large percentage are foreigners who, in their own countries, have had little or nothing to do with horses and mules. Many such regard an animal as merely a piece of mechanism entirely devoid of feeling, and treat it as such. As an example of the ignorance of the pulling capacity of a horse may be cited an instance related by the veterinary surgeon of the fuel company.

Two foreigners had hitched a horse to 12 large mine cars, each weighing when empty 2450 lb. In each of these cars was about a ton of grain. Two of the wagons were off the track and all were on an up grade, yet these men could not understand why the horse could not pull the load and abused it accordingly. The company has splendid animals, costing much money, and it takes pride in them. If by teaching men to understand English they can then be taught the care and abilities of a horse or mule, much would be accomplished.

While the details of this educational campaign are not all elaborated, it was the opinion of the meeting that it would be best to give an elementary course in reading and writing first and as the students become able to understand English to instruct them in mining methods, safety, etc. The public-school principals will be given authority to decide whether the men by their neatness and cleanliness are fit to enter the classes. It is hoped that in this way the desire for cleaner and more sanitary living quarters will be developed.



College of Mines, University of Washington

The annual short session for mining-men at the University of Washington recently closed its eighteenth year. In many respects it was the most successful in years, 38 students having registered for the work, 2 of whom were women. Of the entire registration 30 remained for practically the entire period. Quartz-mining subjects appealed to the greater number, with placer-mining next in interest. The oldest student was 52 years old, the youngest 19. Eleven of the men had previously attended some college and 3 were graduates. Most of the remaining students came with ordinary school preparation. Washington, British Columbia and Alaska were given as the addresses for most of those attending. Three students had previously attended the short session and returned for special work. Next year the nineteenth session will begin on Jan. 3 and will run for three months.

Discussion by Readers

Effect of Head on Pump Motor

Some time since there appeared in *Coal Age* (Vol. 7, p. 178) an inquiry by Richard Todhunter, asking what will be the effect on the motor driving a centrifugal pump if the head is reduced from 150 ft. to 75 ft. while the motor is operated at the same speed. The answer given at that time by some pump engineers was to the effect that under the reduced head a much larger quantity of water would pass through the pump, which would result in overloading the motive power, unless the pump was particularly designed to avoid this effect.

Later, H. D. Roberts opposed this opinion of the pump engineers, stating (*Coal Age*, p. 304) that he thought they were in error in saying that the motive power would be overloaded. Mr. Roberts presented some good figures to support his contention; but, in my opinion, the answer given by the pump engineers is correct. I will cite an instance that occurred under similar conditions, in my own experience, which proves the engineers' theory.

Our company had a double-gage, Weinman centrifugal pump, driven by a 40-hp. motor and discharging about 400 gal. of water per minute through a 4-in. discharge pipe. The pipe line was 1500 ft. long and had a vertical rise of about 10 ft. The pump was making 1100 r.p.m. under these conditions. As this arrangement was unsatisfactory in a wet season, it was decided to drive a ditch that would afford natural drainage. When the ditch had reached a certain point, I concluded to cut the pipe line and permit the water to flow into the ditch at that point. By this means the pipe line was shortened 600 ft. and the 10-ft. rise or head practically eliminated. I estimated that I could save power by doing this and use the extra pipe for the other pump.

At this time, however, my troubles began. The result of cutting the pipe line at the point mentioned was to cause a continual sparking on the commutator. We replaced the carbon brushes with soft graphite brushes; but that did not overcome the trouble. I then decided that, inasmuch as I had reduced the work of the pump nearly one-half, I should also reduce its speed, which could be done, as the pump was belt-driven. I took the matter up with the chief electrician and it was decided to use a smaller pulley on the motor, which would reduce the speed of the pump from 1100 to 920 r.p.m. This completely overcame the trouble.

In the course of time the ditch was completed and, as there was no longer any use for the pump at that place, it was moved to another location to take the place of two other pumps that were not doing satisfactory work. In moving the pump the small drive-pulley was damaged and we had to resort to the larger pulley formerly used for driving the pump. The result was that in two days the armature of the motor burned out. We put in another armature and bought another small pulley, after doing which there was no further trouble. In its new location the pump is discharging through a pipe line 1000 ft. long and having a lift of about 8 ft. This

experience convinced me that when the lift of the pump is reduced one-half and the pump run at the same speed, the motor will be overloaded, as stated by the pump engineers.

PETER DRINNAN,
Mannering, W. Va.

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Longwall vs. Room-and-Pillar Mining

Letter No. 2—I am a great believer in the longwall method of mining, and would like to render my decision in respect to the relative merits of this method as compared with that known as the room-and-pillar system of mining. I read carefully the arguments on the two sides of this question, as presented by Fred Morck, *Coal Age*, July 10, p. 60.

I want to say, in the first place, that the longwall method is the most improved and up-to-date system of mining coal in use at the present time, as it gives a larger extraction of coal, greater safety to the men and better ventilation of the mine, which reduces the risk of an explosion occurring to a minimum. Can the advocates of the room-and-pillar system claim for a moment that they are following the motto, "Safety the first consideration"? They must acknowledge that nothing is more dangerous in the mining of coal than the poor ventilation of the working face that is so general in the room-and-pillar system, especially after the rooms have advanced beyond one or two breakthroughs.

We have only to look back in the records to find that all the large explosions, costing many lives and destroying much property, have occurred in mines worked on the room-and-pillar system. I do not think there is any record of an explosion occurring in a longwall mine. This fact alone should be a great argument in favor of that system of mining.

Again, it must be acknowledged that there is a great waste of coal that cannot be recovered when the mine is worked on the room-and-pillar system. In many localities where that system is used, not more than 50 or 60 per cent. of the coal is taken out, the remainder being left in the pillars. While I freely admit that it is possible to work any seam of coal on the room-and-pillar system, I claim that system cannot be worked economically and the mine be made to pay in many cases.

There is another important item in favor of the longwall system, and that is the facilities it affords for the cheap transportation of the coal from the face to the shaft bottom. I mean that the roads are more direct, leading to all points of the working face in every longwall mine. I consider that these advantages are of the utmost importance in the mining of coal and show that the longwall method is safer, healthier and more economical than any other system of mining.

G. R. WADDELL.

Moundsville, W. Va.

The Mine-Car Question

Letter No. 5—In an article published in *Coal Age*, May 1, p. 752, R. Z. Virgin suggests that the present tendency to use mine cars of large capacity, and consequently heavy weight, together with the increase of weight due to various alleged improvements, may be unwise, since these all tend to increase the first cost as well as the cost of maintenance of both cars and trackage, to say nothing of the increased cost of operation.

Mr. Virgin suggests that, owing to the increase in dead weight of mine cars without a corresponding increase in capacity, there may result a reversion to the old style, lighter weight and smaller capacity of the car. He states that certain cars of 2 tons' capacity, weighing formerly 1800 lb., now weigh from 2800 to 3500 lb., which is certainly a disproportionate increase and, I should say, shows poor design.

I believe there is a practical limit to the size of mine cars, and a point where refinements increase instead of decrease the cost of underground haulage. When one reflects that transporting the coal from the place where it is mined to the surface where it is loaded for shipment constitutes the greatest factor in coal-mining economy, the design of cars that will give the maximum of efficiency deserves the most careful attention.

In my opinion the selection of the type and size of car best adapted to given conditions does not permit of a wide choice, but is limited by local considerations. Too often it has happened that the mine car in use is a development of an original type that someone thought best served the purpose, and changes were made from time to time, as dictated by experience. This has established a certain "standard" type, which was duplicated whenever new cars were added to the equipment of the mine.

In the study of the dimensions of the car best suited to existing conditions, the following items should be carefully considered:

- Thickness of coal seam, as influencing the height of the car.

- Nature of top and bottom of seam, as necessitating the driving of more or less narrow entries and thus influencing the width of the car.

- A soft bottom having a tendency to heave may make it wise to reduce the height of the car so as to require less headroom in entries that may be affected by a squeeze.

- The dimensions of the hoisting shaft that may limit either the length or width of the car, or both.

- The gage of the track, as influencing the width of the car.

- The loading of the cars at the working face, as influencing the height and style of the car.

The following conditions should be carefully considered in deciding on the capacity of the mine cars:

- Where the coal is mined on a basis of screened coal—that is to say, where the operators' and miners' agreement provides for payment at a stipulated rate for all coal passing over a $1\frac{1}{4}$ -in. bar-screen, 6 ft. wide and 12 ft. long, it is not possible to effectively screen more than two tons of coal dumped rapidly from the usual automatic dump-cage.

- When operating on the mine-run basis, the only consideration affecting the capacity of mine cars is the ease

of moving the cars, especially the handling of the cars by the miner in his working place. This question can only be decided after carefully studying the local conditions in respect to the grades of the haulage roads, the ease with which cars can be handled at the face, and whether mules or locomotives are used for gathering the cars. At the best, mine tracks are not surfaced or aligned like railroad tracks and are frequently subject to short heavy grades, which would forbid the use of cars of large capacity. It must be remembered that derailments are liable to occur at frequent intervals, and will cause much delay, unless the car can be quickly replaced on the track. These considerations call for the correct judgment of local conditions.

While it is true that the use of heavier cars calls for heavier locomotives and rails and better tracks, this fact can hardly be construed as a criticism of their use if transportation facilities are thereby improved, resulting in speedier trips, fewer wrecks and less power consumption per ton-mile, which all operate to produce cheaper coal, or reduce the cost of production. As the capacity of the mine car is increased the ratio of dead load to live load is lessened. It must be remembered that practically the same time is consumed for gathering the mine cars and hauling them to the surface whether the cars have a capacity of two tons or four tons each. Likewise, the operations of coupling, spragging, trapping, caging, hoisting and dumping are practically the same without regard to the capacity of the car. With these considerations in mind, it is difficult to see how a light car of small capacity possesses any advantage over a car of larger capacity, although the latter is heavier and requires heavier equipment generally, provided the conditions permit the use of cars of such capacity.

Mr. Virgin raises the question of whether the loader shares the benefit derived from the use of cars of large capacity. The answer to this question is that if the ratio of dead weight to live load is properly proportioned, the loader shares with the operator in the increased output afforded by cars of larger capacity. There is, besides, less chance of his being unable to load the coal mined, for lack of sufficient cars. The larger cars thus afford the miner a chance to increase his earnings, and incidentally attract to the mine a better class of loaders who are looking for places where they can earn more than an average wage.

Having decided on the capacity of the car that should be adopted in a given mine in accordance with the foregoing suggestions, the dimensions of the car must be worked out similar to that described in *Coal Age*, May 22, p. 904. The cross-section of the car must be determined first, the width of the bottom being made 6 in. less than the track gage when $1\frac{1}{2}$ in. lumber is used. The height of the bottom portion of the car should be just sufficient to permit the flare-board to clear the wheels, allowing room for the cage-keeper, if in use, above the wheel. It is important to keep this height of the lower portion of the car as small as possible. It is determined by the half-diameter of the wheel, the thickness of the lumber used and the sizes of the axles and bearings.

The flare-board is often laid flatter than a 45-deg. angle, so as to increase the width of the car as rapidly as possible above the wheels. The support of this flare-

board naturally is more difficult, as its inclination is flatter. A pitch of one vertical to four horizontal is not uncommon, and the width of the board often reaches 15 or 16 in. This must all be determined, however, in connection with the limiting width of the car.

The next step is to determine the height of the top-rail of the car above the track, or the depth of the car above the top of the flare-board. This, together with the amount of "topping" permitted, is limited by the maximum headroom allowed. Regard must also be had to the convenience of loading the car at the working face. My experience is that 44 in. is about the maximum desirable height of the top-rail of the car above the track, to permit of easy shoveling.

Having worked out the dimensions of the cross-section of the car and calculated its area, the inside length of the car is obtained by dividing the necessary cubical capacity (allowing, say 40 cu.ft. per ton of mine-run coal) by the sectional area in square feet. To the length so obtained must be added a sufficient allowance for the thickness of the end-boards and bumpers at each end of the car. It may happen that the results obtained will exceed the permissible length of the cars, as determined by certain limiting local conditions. In that case it will be necessary to alter the sectional dimensions sufficiently to give the desired length, or reduce the capacity of the car.

The size of wheel to be used will depend mostly on the weight of the loaded car. Larger wheels are easier-running and wear longer than wheels of less diameter. The width of the wheel through the hub should be sufficient to furnish a wide bearing on the axle, which should be symmetrical with the tread of the wheel on the rail.

Both square and round axles are in general use. The square axle is strapped directly to the car bottom, which construction is more easily maintained than the round axle running in boxes attached to the car bottom. The latter, however, permits a more uniform distribution of the load on the axle and produces a more uniform wear of the bearings than is possible in the use of square axles, where the weight rests on the journals at the ends of the axles. Channel-iron, plates and bars of special form are frequently used to maintain the boxes in proper position and alignment. The size of the axle may be calculated by considering it as a beam uniformly loaded and supported at its two ends, allowing an ultimate strength of 100,000 lb. per sq.in. for axle-steel and using 8 as a factor of safety.

The wheelbase of mine cars is necessarily small in order to facilitate the replacing of the car on the track when derailed. A short wheelbase also permits the use of curves of shorter radius. Approximately $\frac{1}{4}$ the length of the body of the car may be taken as the necessary wheelbase.

The track gage is usually determined by local conditions, present practice using wider gages than were formerly employed, which marks a general improvement in haulage equipment. Mine track gages of 36, 40, 42 and 48 in. are in common use. Car bumpers should be long enough to prevent the corners of the cars coming together on the sharpest curve allowed in the mine. The bumpers should be thick enough to prevent their riding each other. Couplings should be long enough to avoid cramping the bumpers on sharp curves.

The number and size of body irons depend on the size of the car; but irons of good thickness are economical, as the corrosive action of mine water wears them away. In my opinion, a reasonable increase in the weight of a mine car, caused by a suitable reinforcement that tends to prolong the life of the car and keep it out of the repair shop, and prevent the frequent occurrence of wrecks resulting in much delay and loss of output, is always well justified and desirable. These practical considerations are of even greater importance than the restriction of the ratio of dead weight to live load.

I have thus attempted to present in a general way what appeals to me as the more important considerations affecting the design of mine cars. My conclusions are based on my personal observation and experience in the design and use of such cars and a judgment that has led me to argue for a reasonably big car built for long service. While I realize that others, like Mr. Virgin, may take the contrary view, I feel that the subject is one of great practical importance, and I hope to see it thoroughly discussed.

W. E. BUSS.

Harrisburg, Ill.

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Mining Laws and Legislation

Letter No. 6—Referring to Mr. Hogarth's letter, No. 4, *Coal Age*, June 5, p. 988, in which he attempts to prove that the assistant mine foreman is a legally responsible official under the bituminous mine law of Pennsylvania, I want to ask him to point out the section of the law under which the assistant mine foreman can be held responsible for any of his acts in an official capacity. I have stated in a previous letter that by the phraseology of the law the assistant mine foreman is an irresponsible party. This statement is based not on opinion but on facts, confirmed by the reading of the law.

The bituminous mine law distinctly states that the assistant foreman shall act under the instructions of the mine foreman. This statement does not necessarily imply that the assistant must receive detailed instructions from his foreman relative to the work of each shift. To assume such a meaning would be to frustrate the purpose of this provision of the law, since the mine foreman would then have personally to inspect the entire mine so as to be able to direct the work in each section intelligently. The law provides the assistant to relieve the mine foreman of this burden. I understand, however, the intention of the law to be that the assistant shall have the authority of a mine foreman in his particular section of the mine, with the sanction and consent of the mine foreman, who is the responsible party.

I presume that Mr. Hogarth, as a citizen of the United States, knows that when an individual is elected as a representative either to a State Assembly or to a Federal Congress he is immune from arrest by the civil authorities, except for certain specific crimes. The reason for this is that the law recognizes such a representative not as an individual but as impersonating a constituency. The law regards that his actions during his term of office are virtually the actions of his constituents.

I would ask, again, why does a mine inspector make his recommendation to the mine foreman and not to the assistant foreman? The reason is plain—because the law permits him to hold only one individual responsible.

I believe Mr. Hogarth is in error when he states that "the mine foreman is responsible only for the orders given to his assistant, and the assistant for the faithful performance of the same." If this is true, the foreman's responsibility is limited to his issuing correct orders and the assistant's responsibility to the degree of faithfulness with which these orders are carried out. In my opinion, such a conception applies only to specific orders or instructions given by the foreman to his assistant. It appears to me that if the application were general, all responsibility would be shifted from the shoulders of the mine foreman to those of his assistant and the foreman would be free.

When a mine foreman gives a specific order to his assistant and an accident occurs as the result of the assistant's carrying out such an order, the responsibility for the accident is undoubtedly the mine foreman's; but Mr. Hogarth would have us believe that if an accident occurs under the direction of the assistant foreman when no specific orders have been given, the responsibility rests on the assistant and not upon the foreman. I do not regard this as the meaning of the law.

When Mr. Hogarth states that the mine foreman can be held responsible only for the orders he issues and for the employment of those whom he believes to be competent men to act as his assistants, he practically admits

that the responsibility for the assistant foreman's official acts rests upon the foreman, inasmuch as he is made responsible for employing a competent man.

In reply to the insinuation that I regard the foreman as a mere figurehead, whom the law authorizes to employ a sufficient number of assistants to perform his work, I would draw attention to the reading of the bituminous mine law, art. 4, sec. 1, where it states in the second paragraph: "When the mine workings become so extensive that the foreman is unable, personally, to carry out the requirements of this act, pertaining to his duties, he shall have the right to employ a sufficient number of competent persons to act as his assistants," etc. As I understand the reading of this law, the entire work performed by the assistant makes up the duties referred to in the law as the mine foreman's duties.

Mr. Hogarth states that he does not think for a moment that any mine foreman would attempt to hide behind his assistant or throw the responsibility that was his own on the other man's shoulders. I want to refer him to the case of Willis vs. Commonwealth, in the 20th bituminous district of Pennsylvania. Mr. Hogarth seems to express his opinion of what the law should be, while I have tried to show what the law actually is as it reads.

I. C. PARFITT.

Jerome, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Sources of Heat—In a sense the sun is the original source of most of the heat of the solar system—in other words, the sun is the power house of that system. It may be said that much of the terrestrial life and activity emanates from the sun. The source of the sun's heat is understood to be the chemical and possibly electrical activities being constantly developed in its huge mass and radiating heat, light and electrical energy.

The same chemical and possibly electrical activities are taking place to a less degree in the mass of the earth, creating internal heat. Both the radiated heat of the sun and the internal heat of the earth are **natural sources of heat**.

Besides these natural or physical sources of heat, there are the **mechanical sources of heat**, such as **friction, impact and pressure**. These each develop heat as the result of force applied mechanically.

Chemical Heat—Theory assumes that chemical heat is the result of the **chemical affinity** of material atoms for each other, by which they are drawn and held in more or less close contact and union. This condition is in harmony with the notion of "atomic heat," explained elsewhere, and suggests the estimation of the **heat of formation, or heat of combination**, as the result of chemical union.

In contrast with atomic heat, **molecular heat** is akin to specific heat and representative of the heat capacity of a substance, or the quantity of heat a particular substance will absorb, per unit weight, per degree of rise in its temperature. Theory assumes that all heat of any nature is a vibratory state of atoms or molecules and, as such, is convertible into or created by other forms of energy.

The **molecular heat** of a substance is found by multiplying a gram-molecule of the substance by its specific heat.

Combining Heat—All matter is assumed to possess a certain definite heat energy peculiar to itself, which is expressed in heat units, per unit weight of substance.

Heat of Formation—In the combining of atoms to form compound molecules, a neutralization of the energies of the combining atoms causes either an evolution or an absorption of heat, the molecule formed then possessing an amount of heat called "heat of formation" or "heat of combination."

Heat Due to Friction—Friction is caused by one body rubbing against another, whereby a molecular vibration is set up in the two bodies, as manifested by the heat generated.

Heat Due to Impact—The impact of one body against another likewise sets up a molecular vibration in the bodies, which is manifested by the heat generated.

Heat Due to Pressure—Pressure applied to a body having a degree of elasticity, or being compressible, forces the molecules of matter closer together, which reduces the intermolecular space and, as a result, there being no loss of molecular energy, the speed of vibration is increased in proportion as the space is diminished and heat is developed.

Transformation of Heat Energy—Heat energy of any nature, whether chemical or physical, is convertible, without loss, into mechanical energy measured in foot-pounds, which is the "mechanical equivalent of heat."

The Coal Age Pocket Book

THERMOCHEMISTRY

Thermochimistry treats of the heat changes that accompany all chemical reactions. A knowledge of such heat changes is of the greatest importance in the study of explosive phenomena.

Heat Changes—In a chemical reaction, combination always takes place, the heat energy of the compound or compounds formed being the **heat or heats of formation**.

Chemical reaction may also be accompanied by dissociation or decomposition of a compound, its heat of formation being then **heat of decomposition**, which neutralizes or is neutralized by the heats of formation of the products of the reaction. The heat of decomposition of a substance is always equal to its heat of formation.

The **heat of elements**, in a reaction, is always zero, there being no combination or dissociation in the element.

When the sum of the heats of formation of the products of a reaction is greater than the total heat of decomposition **heat is liberated** and the reaction is "exothermic." When the total heat of decomposition is the greater, heat is absorbed and the reaction is then "endothermic."

Heat of Combustion—This term is generally applied to the heat liberated in the oxidation of a combustible. The reaction is exothermic; and, in general,

Heat of combustion = Heat of formation — Heat of formation

The heat of combustion of a substance, like combining heat and heats of formation or decomposition, is expressed in heat units, per unit weight of substance. The following table gives the heats of combustion of some of the more important combustibles in mining:

TABLE OF HEATS OF COMBUSTION (Favre & Silbermann)

Combustible	Heat of Combustion, B.t.u. per lb.
Methane, to carbon dioxide and water at 32 deg. F.	23,513
Olefiant gas, to carbon dioxide and water at 32 deg. F.	21,344
Carbon, to carbon dioxide	14,544
Carbon monoxide, to carbon dioxide	4,451
Hydrogen, to water at 32 deg. F.	4,325
Hydrogen, to steam at 212 deg. F.	62,032
Sulphur, to sulphur dioxide	51,717
Petroleum, heavy (sp.gr. 0.886)	4,000
Petroleum, light (sp.gr. 0.833)	19,000
Coal, average values, (State) (Fixed Carbon)	18,200
Anthracite	Pennsylvania 84.3%
Bituminous	Pennsylvania 57.0%
Bituminous	West Virginia 65.8%
Bituminous	Illinois 46.4%
Bituminous	Ohio 51.5%
Bituminous	Kentucky 50.1%
Bituminous	Alabama 59.3%
Bituminous	Indiana 44.3%
	14,200
	14,900
	14,240
	14,460
	14,400
	12,700
	13,700
	14,140

The above are average values for each entire state, as taken from Government analyses and do not represent mining districts.

Inquiries of General Interest

Preserving Mine Timber

I desire to ask: (a) Is there any method in use for preserving mine timbers, particularly the crossbars used in mines, by dipping them in creosote, zinc sulphate or other preserving solutions, and what results have been accomplished by so doing? (b) Is it necessary to kiln-dry such timbers before dipping them? (c) What solution is considered best and cheapest for this purpose, and how long should such timbers be left in the solution? (d) Are there any data available showing the increase in the life of mine timbers when treated by any process intended to preserve the wood?

E. C. LEIGHTTY.

Danville, Ill.

These questions were submitted to the chemist of one of the largest manufacturers of wood preservatives and elicited the following reply:

(a) There are various methods in use of treating mine timbers with special preservatives—creosote, zinc sulphate, and the like. The results obtained have been satisfactory in proportion to the value of the material used and the thoroughness with which the treatment was effected. Owing to these varying conditions, it is impossible to state more explicitly the results accomplished.

(b) While it is not absolutely necessary that the timber should be kiln-dried before being treated, it is desirable that it should be as dry as possible, so that the wood will more readily absorb the preserving solution. This is particularly true in respect to creosote preservatives, which are the most efficient, because the creosote cannot penetrate the wood when the pores are full of moisture.

(c) In regard to what solution will prove the best and cheapest to use for preserving large timbers by dipping them, I may state that the coal-tar distillates have proved to be by far the most effective and economical. A wood preservative known as "conservo"—a brownish oily liquid distilled from coal tar—is the result of several years of experiments made to develop a liquid that will be sufficiently fluid to penetrate the wood and at the same time have sufficient substance to prevent its evaporation and loss, which would destroy the permanency of its preserving effect.

This preservative destroys bacteria and sterilizes the wood. It is practically nonvolatile and insoluble in water, which prevents its loss when timbers so treated are submerged or exposed to the action of moisture. It can be applied either hot or cold—with a brush, as paint is applied, or by dipping the timbers in tanks containing the liquid. The latter method is recommended for the treatment of mine timbers.

The length of time that the timbers should remain submerged in the tank depends on the character of the wood and whether the preservative is used hot or cold. It is always better to apply heat when that is feasible, because the heat increases the penetrating power of the preservative and drives out any latent moisture from the wood.

A steam coil placed in the bottom of the tank will serve to heat the liquid and shorten the time of treatment, which can be varied from a few seconds to several minutes, depending on the degree of heat employed, the character of the wood and the thoroughness of application desired. The wood should be as dry as possible before placing in the tank. In special cases when great permanence is desired and the timbers are large, they are allowed to remain soaking in the tank for a longer period.

(d) The only available data respecting the increase in the life of timbers treated by different methods are to be found in the various publications of the Forest Service, United States Department of Agriculture. Circular No. 101, entitled "Treating Timber with the Open-Tank Process," is said to be out of print. There is much valuable information, however, contained in circulars Nos. 108 and 111, of the Forest Service Bureau—the former being entitled "The Strength of Wood as Influenced by Moisture," and the latter "Prolonging the Life of Mine Timbers." These publications were issued in the summer and fall of 1907. In addition to the brush and open-tank methods, the Government experimented on treating timbers in a closed cylinder under pressure, which greatly increased the penetration and effect of the preservative. The report shows that the life of timber treated with a creosote solution by these methods was prolonged as follows: Brush treatment, 6 per cent.; tank treatment, 41 per cent.; and cylinder treatment, 55 per cent.

■

Fireproofing Mine Canvas

Can you tell me how to fireproof canvas used for brattice cloth in the ventilation of a mine?

H. A. EVEREST,
Superintendent, Hazelton Coal Co.
Coalgate, Okla.

Numerous preparations have been used from time to time to render fabrics fireproof, and these attempts have met with variable success. For this purpose such salts as the silicates of zinc, lead and tin have been mostly employed. Certain firms interested in the question of fireproofing material have made a careful study of the subject, with the result that more or less effective fireproofing solutions have been prepared and are now offered on the market. The price of these solutions is practically prohibitive for mine use.

The Antipyros Co., 170 Greene St., New York City, offers for sale heavy duck canvas, in rolls of 50, 100 and 150 yd., 2 yd. wide, which is claimed to be fireproof and suitable for mine use as brattice cloth.

Readers of *Coal Age* will be glad to learn of the experience of any who have attempted the fireproofing of cloth and other combustible material used in mines. A preparation known as "oxylene" has recently been employed with much success in fireproofing timber in England, but has not as yet, we believe, been used in this country.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—If a collar 6 ft. long and 8 in. in diameter supports a certain weight, what must be the diameter of a collar 12 ft. long to support the same weight?

Ans.—The question omits to state whether the entire load resting on the full length of the collar or the unit load per foot of length is intended. The solution is different in each case. For the same total load, the diameter of the collar varies directly as the cube root of the length of the collar; or, in other words, the diameter ratio is equal to the cube root of the length ratio, which gives in this case, calling the required diameter x ,

$$\frac{x}{8} = \sqrt[3]{\frac{12}{6}} = \sqrt[3]{2} = 1.26$$

$$x = 8 \times 1.26 = \text{say } 10 \text{ in.}$$

The more usual condition in mining practice is, however, the unit load, or load per foot of length, corresponding to the roof pressure that the timbers must support. In this case the diameter of the collar varies directly as the cube root of the square of the length, which gives

$$x = 8 \times \sqrt[3]{2^2} = 8 \times \sqrt[3]{4}$$

$$x = 8 \times 1.58 = 12.6 \text{ in.}$$

Ques.—If the temperature of 10 cu.ft. of air is raised from 60 to 580 deg. F., what amount of work will be done?

Ans.—In the free expansion of air the external work performed is that required to overcome the atmospheric pressure (14.7 lb. per sq.in. or 2116.8 lb. per sq.ft., sea level). Assuming a column of air having a base of 1 sq.ft. and 10 ft. in height, and supposing the expansion to take place in the direction of the height of the column, since the volume of air varies directly as its absolute temperature, the height of the air column after expansion will be

$$\frac{460 + 580}{460 + 60} \times 10 = \frac{1040}{520} \times 10 = 20 \text{ ft.}$$

The increase in the height of the column is then $20 - 10 = 10$ ft. and the work performed, in this case, is $2116.8 \times 10 = 21,168$ ft.-lb.

A similar result can be obtained by estimating the work on a heat-unit basis. Evidently the external work performed in the free expansion of air corresponds to the difference between the absorption of heat by air under constant pressure and that under constant volume. For a single pound of air, and one degree (F.) rise in temperature, this difference is the difference between the specific heat of air for constant pressure (0.2374) and that for constant volume (0.1689), which gives $0.2374 - 0.1689 = 0.0685$ B.t.u.

The weight of 10 cu.ft. of air at atmospheric pressure (sea level) and a temperature of 60 deg. F. is $10 \times 0.0766 = 0.766$ lb. The total rise in temperature, in this case, is $580 - 60 = 520$ deg. F. Then since 1 B.t.u. equals 778 ft.-lb. of work, the external

work performed in the expansion of 10 cu.ft. of air, owing to a rise of temperature from 60 deg. to 580 deg. F., is

$$0.0685 \times 0.766 \times 520 \times 778 = 21,227 \text{ ft.-lb.}$$

Ques.—How many pounds of carbon will be required to burn 100 lb. of oxygen in the production of carbon monoxide?

Ans.—In the production of carbon monoxide by the burning of carbon in oxygen one atom of oxygen unites with one atom of carbon to form a molecule of carbon monoxide (CO). The relative weights of carbon and oxygen in this reaction are expressed by their atomic weights—carbon, 12; oxygen, 16. Hence, calling the weight of carbon required to consume 100 lb. of oxygen x , we have

$$16 : 12 :: 100 : x = 75 \text{ lb.}$$

Ques.—A fan running at 70 r.p.m. produces 120,000 cu.ft. of air per min. under a 2.5 in. water gage. At what speed must the fan run to produce 150,000 cu.ft. of air per min. in this mine, and what would the water gage be for this increased speed and circulation?

Ans.—In fan ventilation the volume is commonly assumed as being proportional to the speed of the fan. In other words, the volume ratio is assumed to be equal to the speed ratio of the fan. On this basis, calling the required speed of the fan x , we have

$$\frac{x}{70} = \frac{150,000}{120,000} = \frac{5}{4} = 1.25$$

$$x = 1.25 \times 70 = 87.5 \text{ r.p.m.}$$

In practice this result is not realized, but the fourth power of the speed ratio is equal to the fifth power of the quantity ratio, which gives, in this case,

$$\frac{x}{70} = \sqrt[5]{\left(\frac{5}{4}\right)^5} = \sqrt[5]{1.25^5} = 1.32$$

$$x = 70 \times 1.32 = 92.4 \text{ r.p.m.}$$

For the same conditions in the mine, the water gage varies with the square of the quantity of air in circulation. Hence, calling the required water gage x , we have, in this case

$$\frac{x}{2.5} = \left(\frac{5}{4}\right)^2 = 1.25^2 = 1.56$$

$$x = 2.5 \times 1.56 = 3.9 \text{ in.}$$

Ques.—Under what conditions may afterdamp become explosive?

Ans.—When the afterdamp of an explosion contains considerable unburned methane or a large proportion of carbon monoxide the mixture may become again explosive by the addition of fresh air proceeding from other portions of the workings of the mine or supplied by the readjustment of the air current.

Ques.—What changes take place in the atmosphere of a mine during an explosion of firedamp?

Ans.—The oxygen of the mine air combines with the carbon and the hydrogen of the firedamp to form carbon dioxide and water vapor and some carbon monoxide is produced if the supply of air is limited.

Coal and Coke News

PENNSYLVANIA

Anthracite

Scranton—While the mining of anthracite by machine has not been generally adopted it is probably being used to a greater extent in the cutting of coal in this district than anywhere else in the anthracite region. The miners admit that the cutting of coal by machine is practically in its infancy, yet they realize that it is rapidly coming to be an important factor in the industry and are asking that an agreement be made with the operators whereby this grade of work will be paid for at an equitable rate.

Pottsville—The local strike which has existed at the Locust Gap colliery of the Philadelphia & Reading Coal & Iron Co. since last May has been practically ended by the men agreeing to return to work pending an appeal of their grievance to the Conciliation Board. The suspension was caused by a dispute as to the method of payment, and 1200 men have been idle for the past two months.

Packer No. 5 colliery of the Lehigh Valley Coal Co., at Lost Creek, has been shut down by a strike. Orders were issued that all inside men should remain on duty a half hour longer than usual. This order was disobeyed by several men and they were discharged. On learning of their dismissal the entire force of 1200 men refused to continue at work.

A new colliery to supply domestic trade is to be started by the Rosenberger Brothers on Sharp Mountain. A coal bed has been discovered which is much harder than any heretofore found in that region. Plans are underway for the construction of a breaker considerably larger than any heretofore built in that locality.

Wilkes-Barre—Damages amounting to \$25,000 are asked for in a suit filed by Frances Michock, of West Nanticoke against the West Nanticoke Coal Co. The husband of the Plaintiff was electrocuted about four months ago and the company is charged with negligence.

Tamaqua—During most of the summer, the Morea and New Boston collieries of the Dodson Coal Co. have been working three or four days a week. They have recently, however, started working full time.

Shenandoah—Five men were hurt in various mining accidents in the collieries of this vicinity in a single day the past week. Among this number, Peter Nitsavage received probable fatal injuries.

Shamokin—Nine hundred miners at the Hickory Ridge colliery of the Susquehanna Coal Co., recently went on strike to compel some of the employees to pay dues into the union. This tied up the entire plant.

Bituminous

Scottdale—The H. C. Frick Coke Co. recently ordered into operations 260 additional ovens. The plants affected by this order are Colonial No. 1, Continental No. 3, Edenborn, Hecla No. 3, Leisenring Nos. 1, 2 and 3, United, York Run, Hostetter and Whitney.

Connellsville—Nine hundred ovens were recently added to the producing capacity of the Connellsburg coke region, bringing the possibilities of production up to 400,000 tons per week. This production has not been reached, but 371,000 tons weekly has been produced. The furnace ovens are operating at 76½ per cent. capacity, while the merchant interests are operating at 62.6 per cent. There appears to be no particular shortage of labor.

Monessen—A first aid contest to decide who shall hold the silver loving cup for a year will feature the annual picnic and outing of the miners of District No. 5, to be held on Saturday, Aug. 14, at Eldora Park. Over \$300 in prizes will be awarded. Twelve teams are now entered in the first aid events, and probably more will enter. In addition to the cup, the members of the winning team will be given gold and silver medals.

Washington—Charged with violating the bituminous mining laws of the state by carrying black powder in excess of 1 lb. into the Penobscot mine of the Avella Coal Co., two Italian miners were recently placed under arrest on information placed by Mine Inspector C. J. Callaghan of the 26th District. The men were arraigned before Justice of the Peace J. F. Carmichael and held for court.

Herminie—Work has already been started on the grading and opening of the drift mine into the Waynesburg coal bed on the Mitchell farm near Herminie. E. G. Smith, of Irwin, has charge of the construction work.

WEST VIRGINIA

Bluefield—The Raleigh Coal & Coke Co. during June loaded 60,000 tons of coal, which is the largest one month's business ever enjoyed by that firm. Preparations are being made to increase the tonnage to 100,000 tons per month.

Mullens—The Mullens Smokeless Coal Co. recently shipped its first output. This operation is across the Gauley River from the railroad the coal from the mine being transported across the river to the railway in buckets on an aerial tramway.

Parkersburg—The semi-monthly pay of the Consolidation Coal Co. for the first half of July was the largest since 1914, the miners in the Clarksburg Districts receiving \$90,000. The past month was the best in the company's history but prospects for the current month are even better. Twenty-eight thousand seven hundred and fifty-six tons were recently mined in one day.

Moundsville—The Mound City Coal Co. has a force of men at work on a building which is to be used as a mine supply room. Here mine supplies of all descriptions will be kept ready for use at any time.

Gary—The No. 4 stable of the United States Coal & Coke Co. was recently destroyed by fire originating from an unknown cause. It is reported that 14 head of mules were lost in this fire as well as a considerable amount of hay and grain. The monetary loss is estimated at \$4000.

Charleston—During the 21 months that the Workmen's Compensation Law has been in effect in West Virginia, \$136,000 has been paid in pension claims. The Eccles explosion has thus far cost \$29,880, the Layland explosion \$4000 and the Carlisle \$590.

Prosecutions have recently been conducted in two of the mining districts of the state for violations of the law relating to the safety of operations. In one instance occurring at Yukon, McDowell County, a mine foreman was convicted of allowing miners to enter the shaft before the fans had cleared the atmosphere. In another case, 17 miners were found guilty of shooting coal from the solid. Each of the 17 were fined \$10 and costs and warned not to offend again. The mine foreman who allowed the miners to enter before the mine had been cleared of gas was fined \$50 and costs.

KENTUCKY

Lexington—The strike at the mines of the New Jellico Mining Co. in Bell County has been settled. The company granted a 10 per cent. increase to the men. There are still 600 miners out at other mines in Bell County.

Fleming—The Elk Horn Mining Corporation has received some large orders from the Great Lake region for early delivery and makes the announcement of increases in the output. The mines around Fleming, Haymond, McRoberts, Jenkins and Burdine are the most active since developments were first started. Already the railroads are taxed to handle the large tonnage. With increased output more trains will have to be added.

OHIO

Columbus—Ten thousand Hocking Valley miners, two-thirds of whom are idle and the other third earning only a fraction of normal income, have filed, through their officials, a petition with Governor Willis, asking that some means be devised for relieving the destitution of that region. One plan that had previously been proposed by the Governor was to begin construction on public highways throughout the Hocking Valley. The highway department announces that it is out of funds with which to prosecute this enterprise.

Wellston—The first shaft into the new coal region east of Wellston will be started as soon as the elevation of the coal measure can be ascertained by the drillers. The company has taken options on adjoining land which will be thoroughly drilled and proven, in order to determine the levels of No. 2, No. 4 and No. 5 coal beds. The first shaft will have an

equipment capable of securing 2000 tons per day from the No. 2 measure. Six hundred men will be employed in the new Wellston mine.

INDIANA

Bicknell—Robinson Bros. of Lincoln who are sinking a shaft opening for a coal mine near Edwardsport, have reached the River vein. Later they will work a deep coal bed north of this mine.

ILLINOIS

Edwardsville—The suit in assumpsit for \$15,000 by the Illinois Coal Operators Mutual Employees Liability Insurance Co., against the Lumaghi Coal Co., of Collinsville, has been dismissed at the request of the plaintiff. It is believed that a settlement was made out of court. The bill alleged that the defendant failed to live up to the terms of an insurance policy.

Judge J. F. Gillham, of the Madison County Circuit Court has issued an order directing the Illinois Coal Co., to produce its books in court to show how a dividend of \$12,000 was dividend among stockholders on March 2, 1909, two days before suit for an accounting was filed by the Mount Olive and Staunton Coal Co. The Illinois Coal Co. was formerly a flourishing organization. Attorneys for the Mt. Olive and Staunton company have asked permission to file a bill of execution against the stockholders of the Illinois Coal Co. for \$4,118.77, the amount of the judgment obtained in the suit for an accounting. The plaintiff company alleges that when the judgment was given there were no funds in the defendant company to satisfy the judgment.

Carlisle—The Superior Coal Co. has obtained an injunction against the Miller Oil Co. at Staunton and the Ohio Oil Co. in the same field to restrain them from drilling through the coal company's coal rights to reach the oil sands. The court proceeding has put a check upon the Macoupin County oil boom. It is expected that the case will be fought through to the highest courts and the mineral rights of the coal companies determined.

New Baden—The mine of the New Baden Mining Co. has been closed on account of damage to the shaft. It is expected to remain idle 10 or 15 days.

KANSAS

Topeka—John Pellegrino, state mine inspector, reports that the Western Coal & Mining Co., will open its mine in Franklin and expects to employ all the idle men there. The Sheridan Coal Co., is going to open mine No. 8 at Breezy Hill; the Western Coal & Mining Co., already has opened mine No. 14 at Fleming; and the Cherokee & Pittsburgh Coal & Mining Co., has leased mine No. 14 at Capaldo, and expects to start operations shortly.

Pittsburg—One miner was killed and another badly injured in a recent gas explosion at Mine No. 7 of the Sheridan Coal Co. near Mulberry. The plant had been idle several days because of water in the workings.

COLORADO

Denver—The long-pending suit of the Government against the Union Pacific Coal Co. will be heard shortly. The Government seeks to cancel the patents held by the company to 2400 acres of coal land in the vicinity of Durango that had been originally entered under the Timber and Stone Act.

FOREIGN NEWS

Berlin, Germany—It is reported that a mining engineer who went to Turkey, just before that country entered the war, for the purpose of hunting for coal deposits which might make the country independent of foreign sources has found three excellent coal measures. The Turks proceeded to develop these at once, and the German government now believes that the coal problem of its ally will not prove of embarrassment while hostilities last.

Wainwright Inlet, Alaska—It appears that the government can stop the whites from mining coal in Alaska, but not the natives. They have already mined several hundred tons from the bituminous seams near here, and have made arrangements to ship it to their villages. The Eskimos viewpoint since they have learned that black rock will burn, is that the rock was there before the government came along, and the Almighty must have put it there for them to use. Anyway, it burns much better than waterlogged driftwood.

Fernie, B. C.—A further inquiry into the explosion in the "B" North Mine, Coal Creek, which occurred on Jan. 2 of this year has been ordered by W. J. Brower, acting minister of mines in view of the commissioner's report on evidence taken at the investigation in March. This evidence, the min-

ister declares, warrants a further investigation. The new inquiry opened with Judge Forin, of Nelson presiding as commissioner. The preliminary investigation found that the explosion was attributable to an accumulation of gas due to stoppage of the ventilating fan. The mine superintendent and mine foreman are charged with having been dilatory in their duties.

Juneau, Alaska—Discovery of an extensive coal field on Admiralty Island said to be the first of its kind found in Southeastern Alaska, has been reported. The coal was discovered about June 20 by Charles Sandman who at the time was engaged in cruising timber on the island. Having staked a claim Sandman hastened to Juneau where he interested some friends who are now financing the proposition. A patent has been applied for. According to the information obtained from Sandman the coal field is situated on the island 3 miles north of Killisnoo and 30 miles south of Juneau by water. The coal is said to crop out along the shore in such a position that it can be loaded into a steamship direct. Juneau operators are well pleased with the discovery.

PERSONALS

David Fleming, first resident superintendent of the Berwind-White mines, at Windber, Penn., after an absence of 15 years has returned to become the head of the Beacon shaft mine at Dunlo.

William J. von Bonies, mining engineer, of Louisville, Ky., formerly of Davies & von Bonies, engineers, of Louisville and Lexington, Ky., has given up that practice and accepted a position at Joplin, Mo.

James Matthews, president of the miners' organization in the vicinity of Shenandoah, Penn., has been presented with one of the pens used by Governor Brumbaugh in signing Senate bills Nos. 160 and 931, the approval of which acts brought the miners under the provisions of the Workmen's Compensation Law.

White L. Moss, of Pineville, Ky., has resigned his position as vice-president and general manager of the Continental Coal Corporation, whose operations are at Pineville and vicinity. The duties of the office were assumed by Maxwell S. Barker, of Louisville, Ky., chairman of the executive committee, pending the annual meeting held at Chattanooga, Tenn.

George Watkin Evans has been appointed to determine what areas of coal land shall be reserved by the government and what shall be thrown open to lease in Alaska. Mr. Evans is thoroughly familiar with both the Matanuska and Bering fields. While his name is mostly connected with the Matanuska field, owing to the fact that he was in charge of the government work in selecting and extracting the coal from this field to be tested to determine its availability for naval use he is even better acquainted with the Bering River coal field having been over the entire area many times.

OBITUARY

D. B. McClelland, vice-president, treasurer, and a director of Spang, Chalfant & Co., the Fayette Coal Co., and the Spang Land Co., died at his home in Pittsburgh on July 21.

James Elliott, of McAlester, Okla., vice-president and general manager of the Haily-Ola Coal Co., of Hailyville, Okla., and receiver of the Great Western Coal & Coke Co., of Wiburton, Okla., and the Osage Coal & Mining Co., of Krebs, Okla., died recently.

J. W. Ganoe, a well-known merchant and coal operator died suddenly at his residence at Phillipston after returning from a convention of coal men at Buffalo, N. Y. Mr. Ganoe was 64 years of age, and a veteran of the Civil War. He is survived by his widow, four daughters, one son, two sisters and two brothers.

William H. Depew died at his home in Jermyn, Penn., recently, at the age of 66 years. Mr. Depew started work at the age of 16 years for John Jermyn, who owned the breaker known as Jermyn No. 1. This later became the property of the Delaware & Hudson Co., with which firm Mr. Depew remained after the transfer, becoming the head of the blacksmithing department for this company, which position he has held for the past several years.

Joseph R. Bailey, of Fairmont, W. Va., a former resident of Connellsville, was killed while crossing the railroad tracks at Rowlesburg, W. Va. Mr. Bailey came to Connellsville in 1900.

In 1907 he and W. G. McGinnis formed the Pittsburgh Steam Coal Co. and developed the Elizabeth mine. Later they purchased the Opekska mine, of the Marietta-Stillwagon interests, holding it until about two years ago, when it was sold to the Connellsburg Coal & Coke Co. Since then Mr. Bailey has been engaged in the coal and timber business in West Virginia.

TRADE CATALOGS

Joseph T. Ryerson & Son, Chicago, Ill. "Glyco." Illustrated, 70 pp., 4½x7¼ in.

The Milwaukee Fuel Co., Milwaukee, Wis., "Screenings." Illustrated, 15 pp., 6x9 in.

The American Steel & Wire Co., "American Wire Rope." Illustrated, 247 pp., 6x9 in.

Joseph T. Ryerson & Son, Chicago, Ill. "Forged Drills." Illustrated, 51 pp., 4½x7¼ in.

Dodge Sales and Engineering Co., Mishawaka, Ind. Catalog. "Gearing." Illustrated, 126 pp., 6x9 in.

The Gardner Governor Co., Quincy, Ill. "Gardner Air Lift Pumping." Illustrated, 16 pp., 6x9 in.

Knox Motor Associates, Springfield, Mass. "The Knox Tractor." Illustrated, 16 pp., 12x9½ in.

Joseph T. Ryerson & Son, Chicago, Ill. "Concrete Reinforcing." Illustrated, 16 pp., 4½x7¼ in.

The Colonial Supply Co., Pittsburgh, Penn. "Safety First Manual." Illustrated, 88 pp., 7¾x10¾ in.

Scranton Pump Co., Scranton, Penn. Bulletin 102. "Duplex Plunger Pumps." Illustrated, 12 pp., 6x9 in.

The Kerr Turbine Co., Wellsville, N. Y. "Economy Geared Turbines." Sixteen pages, 6x9 in., illustrated.

The American Blower Co., Detroit, Mich. "Sirocco Products." Thirty-two pages, 8½x11 in., illustrated.

The Roberts & Schaefer Co., Chicago, Ill. "Marcus Patent Picking Table Screen." Illustrated, 8 pp., 9x11½ in.

Cresson-Morris Co., Philadelphia, Penn. Form No. 1001. "Barometric Condensers." Illustrated, 28 pp., 9x12 in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 152. Eight pages, 6x9 in., illustrated.

International Mill & Timber Co., Bay City, Mich. Catalog. "Sterling System-Built Houses." Illustrated, 72 pp., 9x12 in.

The Walter A. Zelnicker Supply Co., St. Louis, Mo. "Net Price List of Hickory Handles." Unillustrated, 4 pp., 3¾x6½ in.

Joseph T. Ryerson & Son, Chicago, Ill. "The Largest Iron and Steel Warehouse in the World." Illustrated, 46 pp., 11x8½ in.

Gifford-Wood Co., Hudson, N. Y. Bulletin No. 16. "Portable Wagon Loaders for Handling Coal, etc." Illustrated, 12 pp., 6x9 in.

Link-Belt Co., Philadelphia, Penn. Bulletin No. 221. "Circular Storage System for Storing Coal, etc." Illustrated, 4 pp., 6x9 in.

The Marion Steam Shovel Co., Marion, Ohio. Catalog No. 93. "Marion Reliability and Your Profits." Illustrated, 48 pp., 5½x8 in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 300. "Cameron Triplex Pumps." Four pages, 6x9 in.

National Tube Co., Pittsburgh, Penn. National Bulletin, No. 20. "Index for National Bulletins Nos. 1 to 20." Illustrated, 12 pp., 8½x11 in.

Joseph T. Ryerson & Son, Chicago, Ill. "Internal Furnace Boilers with Morrison Corrugated Furnaces." Illustrated, 21 pp., 4½x7¼ in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 104, "Cameron Pumps." Thirty-six pages, 6x9 in., illustrated.

Link-Belt Co., Philadelphia, Penn. Book No. 210. "Wagon and Truck Loaders for Coal, Coke, Stone, Sand, etc." Illustrated, 48 pp., 6x9 in.

The General Electric Co., Schenectady, N. Y. "Standard Unit Direct Current Power Plant Switchboard Panels." Illustrated, 21 pp., 8x10½ in.

Joseph T. Ryerson & Son, Chicago, Ill. "Ryerson's Ready Reference." A loose leaf book containing much valuable data on steel and steel products.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 104, "Cameron Centrifugal Pumps." Sixteen pages, 6x9 in., illustrated.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 151. "Cameron Turbine Centrifugal Pumps." Twenty pages, 6x9 in., illustrated.

The Harrison Safety Boiler Works, Philadelphia, Penn. Cochrane Engineering Leaflet No. 18, "Testing V-notch Meters." Forty-eight pages, 6x9 in., illustrated.

S K F Ball Bearing Co., 50 Church St., New York. Bulletin No. 25. "S K F Ball Bearings in Machine Tools and Shop Equipments." Illustrated, 68 pp., 6x9 in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 153. "Cameron Centrifugal Pump for House Service." Eight pages, 6x9 in., illustrated.

Chicago Pneumatic Tool Co., Fisher Building, Chicago, Ill. Bulletin No. 34-U. "Instructions for Installing and Operating Class N-SO Fuel Oil Driven Compressors." Illustrated, 24 pp., 6x9 in.

Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill. Bulletin No. 66G. "Air-feed Stoping Drills." Illustrated, 12 pp., 6x9 in. Blue Booklet No. 115. "Air Compressors." Illustrated, 32 pp., 3x5½ in.

The Jeffrey Mfg. Co., Columbus, Ohio. Bulletin No. 165: "Wagon and Truck Loaders for Crushed Stone, Sand, etc." Illustrated, 16 pp., 6x9 in. Bulletin No. 166. "Wagon and Truck Loaders for Bituminous and Anthracite Coals." Illustrated, 24 pp., 6x9 in.

RECENT COAL AND COKE PATENTS

Coke Oven. A. Roberts, Evanston, Ill. 1,132,685 Mar. 23, 1915. Filed Sept. 8, 1914. Serial No. 860,583.

Coal Device. D. Hilleman, St. Louis, Mo. 1,133,141 Mar. 23, 1915. Filed Apr. 7, 1914. Serial No. 830,275.

Mine Tipple Car. J. Cozilets, Coupon, Penn. 1,141,442, June 1, 1915. Filed July 14, 1913. Serial No. 778,967.

Miner's Safety Lamp. E. F. Koehler, Hudson, Mass. 1,132,522 Mar. 16, 1915. Filed Oct. 28, 1912. Serial No. 728,154.

Mechanical Stoker. J. E. Murphy, Winnipeg, Canada. 1,140,761, May 25, 1915. Filed Mar. 10, 1914. Serial No. 823,731.

Steam Boiler Furnace. C. E. Googins, Brooklyn, N. Y. 1,140,674, May 25, 1915. Filed June 15, 1914. Serial No. 845,134.

Coal Loading Machine. F. S. Converse, Binghamton, N. Y. 1,133,008 Mar. 23, 1915. Filed Aug. 10, 1914. Serial No. 856,023.

Mine Car Wheel and Axle. F. A. Sweet, Salt Lake City, Utah, 1,141,990, June 8, 1915. Filed Nov. 28, 1914. Serial No. 874,383.

Coal Washer. A. J. Sayers assignor to Link Belt Co., Chicago, Ill. 1,142,060, June 8, 1915. Filed Aug. 29, 1913. Serial No. 787,254.

Smoke Consumer. G. O'Neil, Moncton, New Brunswick, Canada. 1,131,944 Mar. 16, 1915. Filed Oct. 19, 1914. Serial No. 867,441.

Apparatus for Ejecting Ashes. W. S. Parsons, Ladywell, England. 1,131,951 Mar. 16, 1915. Filed Aug. 4, 1911. Serial No. 642,373.

Screening Conveyor. T. F. Webster assignor to Link Belt Co., Chicago, Ill. 1,142,060, June 8, 1915. Filed Jan. 27, 1912. Serial No. 673,708.

Miners Acetylene Gas Lamp. J. A. Gustafson, Idaho Springs, Colo. 1,142,699, June 8, 1915. Filed Aug. 29, 1914. Serial No. 859,259.

Coal Washing Apparatus. E. G. Burks, and N. Hayes, Birmingham, Ala. 1,132,422 Mar. 16, 1915. Filed July 3, 1914. Serial No. 848,985.

Mechanically Operated Grate for Furnaces. W. R. Wood, London, Eng. 1,142,226 June 1, 1915. Filed Nov. 28, 1914. Serial No. 874,537.

Draft Regulator and Smoke Purifier. J. A. and M. L. McFerran, Louisville, Ky. 1,142,721, June 8, 1915. Filed Oct. 30, 1914. Serial No. 869,463.

Mining Machine. F. L. Sessions, assignor to Jeffrey Mfg. Co., Columbus, Ohio. 1,132,800 Mar. 23, 1915. Filed Sept. 3, 1910. Serial No. 580,410.

Construction of Water Tube Boilers. R. Delaunay, Belleville, St. Denis, France. 1,132,458 Mar. 16, 1915. Filed July 20, 1914. Serial No. 852,077.

Water Tube Boiler. J. E. Bell, assignor to Babcock & Wilcox Co., New York, N. Y. 1,141,520, June 1, 1915. Filed Dec. 26, 1905. Serial No. 293,170.

Automatic Stoker. D. T. Williams assignor to Standard Stoker Co., Wilmington, Del., 1,142,293. June 8, 1915. Filed Oct. 29, 1913. Serial No. 798,009.

Mining Machine Car Truck. C. E. Davis assignor to Goodman Manufacturing Co., Chicago, Ill., 1,141,943. June 8, 1915. Filed Sept. 14, 1912. Serial No. 720,366.

Operating Device for Coke Oven Doors. C. V. McIntire, assignor to H. K. Kopfers Co., Chicago, Ill., 1,141,132. June 1, 1915. Filed Dec. 8, 1913. Serial No. 805,216.

Mining Machine and Truck. E. R. Merrill, assignor to Jeffry Manufacturing Co., Columbus, Ohio, 1,142,348. June 8, 1915. Filed Sept. 12, 1910. Serial No. 581,489.

Coal Gas Generating Apparatus. H. A. Carpenter, assignor to Riter-Conley Mfg. Co., Pittsburgh, Penn., 1,140,798. May 25, 1915. Filed Jan. 2, 1915. Serial No. 118.

Gas Producer. E. A. W. Jeffries and G. H. Isley, assignors to Morgan Construction Co., Worcester, Mass., 1,142,100. June 8, 1915. Filed Mar. 2, 1908. Serial No. 418,656.

Baffle System for Stirling Boilers. D. S. Jacobus assignor to Babcock & Wilcox Co., Bayonne, N. J., 1,132,014. Mar. 16, 1915. Filed Aug. 12, 1913. Serial No. 784,313.

Furnace Stoker for Feeding Coal Dust or Other Coarse-minuted Fuels. C. L. Heisler, Schenectady, N. Y., 1,140,817. May 25, 1915. Filed Jan. 20, 1913. Serial No. 743,202.

INDUSTRIAL NEWS

Garrison, W. Va.—The Roberts & Schaefer Co., of Chicago, Ill., recently closed a contract with the Webb Coal Mining Co. for the equipment of a Marcus patent coal tipple for immediate installation at Garrison.

Birmingham, Ala.—The United States Supreme Court in an action against the Louisville & Nashville, Nashville, Chattanooga & St. Louis, Tennessee Central and Illinois Central railroads has reduced rates on coal from Kentucky mines to Nashville from \$1 to 80 cents.

Grafton, W. Va.—J. M. Shackelford, of Glenville, it is reported has sold all of his coal holdings in Gilmer and Braxton counties, consisting of about 2000 acres to Lloyd Beeghley and Andrew Admiston, both of Weston. The price paid is said to approximate \$200,000. The coal is all of the Pittsburgh vein 8½ ft. thick.

Harrisburg, Penn.—The first monthly reports of coal production by the anthracite companies have reached the office of the Auditor General under the provisions of the tax act of 1915. At a recent conference of coal operators and state officials it was arranged that these reports should be as of the 20th of each month.

Harrisburg, Ill.—The Roberts & Schaefer Co., of Chicago, has been awarded a contract by Charles I. Pierce, president of the Saline County Coal Co. for the equipment of a Marcus patent coal tipple for installation in the Harrisburg, Ill. field. Also an order for the building of two modern bath houses at the mines at Harrisburg.

Portsmouth, N. H.—The entire Navy Yard fire department was recently called out to fight a stubborn fire in the forward bunkers of the United States auxiliary collier "Vulcan." The vessel carried approximately 12,000 tons of coal, 1000 tons of which it is believed have been destroyed. No material damage was done to the collier.

Billings, Mont.—Coal-bearing lands purchased in 1910 as grazing land for \$2 per acre have been finally awarded to the purchasers, Yegen Brothers & Simonsen and their associates. The land is appraised by the government at \$30 per acre, and is said to run rich in coal, but through some error, in the office at Washington, it was sold for \$2 and the government has decided to issue the final certifications, thereby completing the sale.

Seranton, Penn.—The first real effect of the war on the labor situation has been noticeable recently, when 3000 Italian reservists employed in and about the collieries in this vicinity left the city on their way to Italy. The outlook is that quite an additional number will soon be on their way. Because of the dull times at the collieries the men are apparently taking advantage of the opportunity to get back home for a visit.

Rush Run, Ohio.—Officials of the Beech Flats Coal Co. have been looking over their property in this section and it is believed anticipate making an important land deal. It is understood that this firm, together with the Blythe Coal Co. wishes to purchase three or four farms which adjoin the mining property of the two firms. As yet no deal has been

consummated so far as is known. It is thought that part of this land will be stripped in order to secure the coal.

Whitesburg, Ky.—R. D. Baker, of Big Stone Gap, Va., and others are involved in an interesting coal and timber land litigation. Several years ago representatives of the Swift Coal & Timber Co. went into the Line Fork Creek section and purchased some 10,000 acres of coal and timber property. It developed that about 12 months before, R. D. Baker and others representing a Philadelphia corporation had taken options on the same property, the option still being good. A few weeks ago, the Swift Coal & Timber Co. began preparations to develop part of the holdings. Suit was then entered by Mr. Baker and others against this firm, claiming that they were the legal and proper owners. This is one of the largest coal and timber land litigations perhaps ever entered in eastern Kentucky.

Louisville, Ky.—Under a trust agreement filed with the Louisville Trust Co., holders of about \$2,100,000 of bonds of the Continental Coal Corporation, are expected to acquiesce in payment of interest at the rate of 3 per cent. per year, instead of 6 per cent., for the next two years. According to M. S. Barker, chairman of the Executive Committee of the corporation, bondholders having about \$900,000 of the bonds have sent in their consent already, while consent of 80 per cent. of the bondholders is required before the contract becomes effective. This much progress was made in 15 days and completion of the plan is thought to be likely. A semi-annual payment was due July 1, and this disbursement would be affected by the agreement. General depression of business is represented by the officers of the company as the reason for the temporary reduction. The bonds in question were issued in 1911.

Louisville, Ky.—First reviews of the forthcoming official report of C. J. Norwood, chief of the State Department of Mines, shows that 20,168,150 tons of commercial coal were mined in Kentucky in 1914, exceeding the output of the state during any previous year. The net increase is 743,968 tons over 1913, is explained by a big increase in production in Eastern Kentucky and in spite of a decrease in the production in western Kentucky, which showed a falling off of 664,242 tons. During the year there were 53 casualties in the mines of the state. The report also will show that the state had 270 companies operating a total of 364 mines at the end of 1914, located in 39 counties and employing from 32,000 to 33,000 miners. Prof. Norwood will urge the need of additional inspectors and states that he will call all present inspectors to a conference at Lexington, to consider means of making the best of the circumstances until the Legislature makes provision for more inspectors.

New York, N. Y.—Default having occurred in the payment of interest coupons due July 1, 1915 to the holders of Kanawha & Hocking Coal & Coke Co. 50-year first mortgage five per cent. sinking fund gold bonds issued under mortgage to Morton Trust Co., trustee, dated July 1, 1901, a committee has been formed to protect the interests of the bondholders. This committee is of an opinion that an effective demand should be made forthwith upon the companies which guaranteed the principal and interest of the bonds to make good the default of the interest payment and in order to do this bondholders are requested to deposit their holdings with the Bankers Trust Co., No. 16 Wall street. The committee consists of Daniel E. Pomeroy, chairman, vice-president, Bankers Trust Co.; Walker Buckner, vice-president, New York Life Insurance Co.; Lewis L. Clarke, president, American Exchange National Bank, and Stacy C. Richmond, of Winslow, Lanier & Co.

Columbus, Ohio.—A gathering of railroad officials and Ohio coal operators, to the number of about 70, considered the question of coal rates from Ohio fields, at Columbus, on July 19 and 20. The conference was of an informal, friendly nature, to discuss the matter of raising the differential between Ohio and West Virginia. The operators held to their contention that under existing conditions there must be relief in the matter of rates or the bulk of the mines would have to remain idle. It was the belief of some of the railroad men that Ohio producers in some districts had allowed their markets to get away from them through suspension of operation, and that present troubles were due as much to labor as to rate conditions. A committee of 14, composed of railroad men and operators was appointed to present a scheme of action. Another conference will be held at Cleveland shortly when the committee is expected to make a partial report. Every mining district was represented on the committee, as were the following railroads: Hocking Valley, Baltimore & Ohio, New York Central lines, Pennsylvania lines, Wheeling & Lake Erie, and the Wabash-Pittsburgh Terminal. The railroads are suffering large loss of revenue through idleness of Ohio mines.

Coal Trade Reviews

General Review

Anthracite situation continues discouraging. Bituminous and export business erratic with competition more aggressive. Pittsburgh district firmer due to activity in steel. Fall summer dullness prevails in Middle West.

Anthracite prices show no indication of bracing up, although some of the large companies are making an effort to increase operations which would indicate that they believe the dullest part of the year has passed. The individual companies are making heavy concessions on the circular, but they are finding the going hard, most purchasers preferring to deal with the large companies in order to strengthen their connection with them in anticipation of labor troubles next spring. In the meantime the current situation continues discouragingly dull. The storage capacity of the large companies is being taxed to the limit, while the independents are moving a tremendous volume of coal to Tidewater where stocks are already abnormal. The Lake movement continues to decline, and there are persistent rumors of a shortage of storage room at the upper ports.

There is a total absence of any spot demand in the bituminous market and the past week has been one of the worst of the summer. Practically the entire movement is being applied on contracts. Export business is erratic; the Hampton Roads piers are consistently breaking all records, while the movement out of Baltimore has taken a heavy slump and shipments generally are confined more closely to direct contracts while it is noted that a few options for export tonnage have not been taken up. Competition for this business is also becoming more keen, due to the complete lethargy in the general market.

Pittsburgh district operators are slightly firmer in their views as regards prices, due to the beneficial effects resulting from the increased operations at the steel mills. The bituminous movement is apparently increasing and with the large grain shipments now getting underway, it is likely that the pressure on the railroads may be of sufficient proportions to affect the trade. The Lake trade continues discouraging, the only cheerful feature being the possibility of an increase in the August movement.

Generally negative conditions still prevail in the Ohio market. The harvesting of the largest crop in the history of the state is not relieving the pressure in any way although it may help some when the rail movement starts. Industrial conditions are slightly better than during the first half of the year, but this is offset by the extreme caution on the part of the buyers. The stocking season is much behind, and all attempts to force action in this line have met with little success.

The full mid-summer dullness prevails in the Middle Western market, but prices are running somewhat higher than last year, due to the careful restriction in shipments. Intermittent buying of screenings by the large consumers has caused a relapse in this branch. General commercial conditions show some improvement but this is offset by the extreme conservatism in the coal business which is further accentuated by the backwardness in the crops. Heavy war orders continue the most encouraging feature of the market.

A Year Ago—Anthracite trade touches the low point of the year. Firmer tone and improved sentiment in bituminous. Stocks exhausted and buyers finding they have overstayed the market.

BUSINESS OPINIONS

Boston News Bureau—If the new strength of war stocks foreshadows the closing up of additional business, then the market is in a position to receive a fresh impetus, but otherwise an unhealthy situation prevails. The international situation is bound to hang fire for several weeks. In the meantime the index to industrial conditions is best furnished by the heavy advances in the prices of steel products along with tremendous bookings. These tell their own story.

Modern Miller—A very small percentage of winter wheat

crop was threshed this week. In a few favored localities threshers were able to work, but in general the wheat is still standing or in the shock drying out. More activity is expected next week. Rain has fallen in Nebraska, Kansas, northern Oklahoma, northern and southeastern Missouri and Ohio. In Illinois, Indiana and Kentucky the crops are rapidly drying out.

Iron and Steel—The speculative orgy in the market for steel stocks has attracted more attention than the improvements at the steel mills, which is noteworthy. The leading interest is operating about 93% of its ingot capacity, compared with 91% a week ago, and some of the independent mills are now at full rated capacity. It is estimated that at least 25% of current operations are for war orders or the like. There is an unusual program of new steel-plant construction projected in and around the Youngstown district. Prices of billets have again advanced, and on some special commodities prices are unusually high. The activity of the steel mills is so great that the situation in ferro manganese promises again to become acute. Activity in the machine-tool industry continues on just as large a scale as ever.

Southern Lumberman—Enlarged activity in industrial lines, settlement of certain local labor troubles with continued absorption of idle working men, further heavy war orders, increase in bank clearings, and the good crop outlook, are all contributing factors.

American Wool and Cotton Reporter—Manufacturers are cheerful over the openings on lightweight goods. The turning point in the market has arrived, it is felt by some. Prices of goods at the openings were based on present market prices for wool. The goods opened at higher prices than a year ago, and a fair volume of sales was consummated.

Dun's—Apart from the development of further labor controversies, the general situation maintains its favorable aspects. Recent settlement of labor troubles in the building trades in the West has been followed by the adjustment of the local clothing strike, but fresh disturbances have arisen here and elsewhere, notably at oil plants in New Jersey.

Marshall Field & Co.—Although weather conditions have not been conducive to normal retail selling throughout the country, the volume of current wholesale distribution has about equaled that of the same period last year. Fewer merchants have visited the market than a year ago.

Bradstreet's—Growing activity in industrial quarters turning out metals and their products, prospects of big crops, optimistic sentiments as to the future, and better collections, contrast with midsummer quiet in the larger merchandising lines, unrest in labor circles, some conservatism, generated by international political matters, and quite slow buying for fall account.

ATLANTIC SEABOARD

BOSTON

Prices on Hampton Roads coals practically unchanged. Export trade still spotty and coastwise market drags. Georges Creek now in plentiful supply. Pennsylvania grades dull and anthracite very quiet.

Bituminous—No improvement can be reported in the market for Pocahontas and New River. There has been no price movement of any kind and those shippers who were offering concessions a week ago are doing so today. Receipts here are about normal but practically every ton arriving is being applied to contract purchases and not being absorbed by any spot market. The latter simply does not exist. It is a good sign that so little coal is being forced on this territory and it gives reason to hope that if things do start up in the fall there will be room here and there for coal. The fact that the trade is in no worse shape than when last reported is also ground for encouragement.

Agents who distribute coal for inland delivery from Tidewater points are still selling at minimum prices. There is much rivalry for this trade in the larger ports like Boston, Providence and Portland, and it is believed that some of those who have rehandling plants of their own are seeking in this

way to discourage competition on the part of shippers who must use the facilities offered by the railroads.

While the volume of coal moving off-shore is still large, it is mostly on old sales. New business is not coming in with quite the push it had earlier in the season.

Georges Creek is now in ample supply at all points and contractors in New England are beginning to get their full share of this popular grade. If the off-shore demand improves as it is almost certain to do later on it is likely that Georges Creek will again be in arrears in the coastwise trade.

With the Pennsylvania grades trade is also in a dull state. While for some weeks the quality coals had all the business wanted, the operators are now again looking for orders.

Water Freights—There is little to add to last week's report. Rates depend on conditions that change almost daily. There is a surprising amount of rechartering: i.e., shippers who have tonnage under charter are in several cases turning over barges to other shippers at current market rates; 40c. is still the minimum freight on small barges, New York to Long Island Sound ports like Providence and New Bedford.

Anthracite—July business this year is somewhat ahead of 1914, but there is no life to the demand. The last week of the month is usually less dull and while little is said it is realized that July will stand up pretty well for tonnage, considering we are now in the midst of summer dullness.

Prices on bituminous at wholesale are about as follows:

	Clearfields	Cambria	Georges	Pocahontas
	Somerset	Somerset	Creek	New River
Mines*	\$0.85@1.40	\$1.15@1.60	\$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.65@2.80
Boston*				3.55@3.68
Providence*				3.45@3.68
F.o.b.	On cars.			

NEW YORK

Bituminous contract coals moving freely. Spot market quiet. Good demand for export and bunker fuels. Anthracite situation dull. No demand at Tidewater.

Bituminous—Contract coals continue to move freely but shippers report practically no spot demand. Demand for export and bunker coals remains fairly active. New inquiries are being received from France, Spain and Italy and some contracts are reported as having been closed. The end of the month should see as large if not larger export tonnage than in June.

Production in the Pennsylvania regions has been at about half capacity. The local situation shows no improvement. There is a great quantity of unsold coal at the docks while the harbor contains many filled bottoms. Some of the cheaper grades can be bought at about \$2.35 f.o.b., fair grades at 15c. more, while the choice grades are quoted at \$2.65 to \$2.80. Some of the larger New York companies with Philadelphia connections have received inquiries from foreign countries and are preparing to make shipments.

Current quotations are on the following basis:

	South	Port	Mine	
	Amboy	Reading	St. George	Price
Georges Creek Big Vein.	\$3.30@3.40	\$3.30@3.40	\$3.30@3.40	\$1.75@1.85
Georges Creek Tyson.	2.90@3.00	2.90@3.00		1.35@1.45
Clearfield:				
Medium.	2.65@2.80	2.55@2.65		1.10@1.25
Ordinary.	2.55@2.60	2.55@2.60		1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks.	2.90@3.05			1.35@1.50
Nanty Glo.	2.75@2.80			1.20@1.25
Barnesboro.	2.65@2.70			1.10@1.15
Somerset County:				
Quemahoning.		2.70@2.85	2.70@2.85	1.20@1.30
Medium.	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe.	2.45@2.55			.90@1.00
Greensburg.	2.75@2.80			1.10@1.15
Westmoreland.	2.95@3.20			1.15@1.40
West Virginia Fairmont	2.60@2.70	2.60@2.70		.80@.90
Fairmont mine-run.	2.50@2.60	2.50@2.60		.70@.80
Steam.	2.45@2.50	2.45@2.50		.90@.95
Western Maryland.	2.35@2.40	2.35@2.40		.80@.85

Anthracite—With the passing of the two dullest months of the year, handlers of anthracite coal are looking forward to increased business. A reflection of this optimism may be seen in the efforts of a couple of the large companies to operate their mines six days this week. So far demand has not increased at tidewater and there was not the customary rush of orders during the last week of the month to save the discount.

Shippers are disposing of much coal inland and the Lake trade is calling for regular shipments. The Tidewater docks are well loaded and the number of filled bottoms about the harbor has not decreased. Independent miners continue to send all their surplus coal to Tidewater. The companies are reported as storing considerable of their product.

Concessions continue to be made on some of the prepared sizes. The average price on individual coal has made no material change in several weeks. Occasionally a bargain can be picked up at lower figures than the average quotation.

The steam-size situation is practically at a standstill. There is any quantity of the buckwheat coals on hand. The better grades of Nos. 2 and 3 are very scarce. Pea coal is being stocked.

Current quotations follow:

	Lower Ports			Upper Ports
	Circular	Individual	Circular	Individual
Broken.	\$4.85		\$4.90	
Egg.	5.10	\$4.70@5.10	5.15	\$4.75@5.15
Stove.	5.10	4.70@5.10	5.15	4.75@5.15
Chestnut.	5.35	5.00@5.35	5.40	5.05@5.40
Pea.	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.10
Buckwheat.	2.50@2.75	2.00@2.25	2.55@2.80	2.05@2.30
Rice.	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley.	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Anthracite shows slight improvement, although extreme dullness continues. Nut size remains a burden, with stove the most active. Pea moving fairly well, but other steam sizes are weak. Bituminous has the poorest week of the year.

Anthracite—While there has been a very slight improvement, the trade shows no real prospect of bracing for some weeks yet. This is the dullest season of the year and most dealers are only buying to meet actual needs, although some continue to stock up because of the extremely low prices.

This is particularly true of pea; several dealers continue to buy heavily of this size, taking the stand that they can make a larger margin of profit at the existing prices with less capital invested, than if they put their cash in the domestic grades. Plenty of pea is still moving at \$1.50 and there is no trouble at all to buy first grade coal at \$1.75.

Chestnut continues to be the real drug of the market, with egg and stove the most active. A large sale of this latter size has been reported at April circular, but this reduction was made on account of carrying a good tonnage of chestnut with it. Chestnut has been freely offered in several instances at 10c. off April circular. The general price fluctuations are from 10c. below April circular to 10c. below current circular for the family sizes.

Collections continue to be a great source of worry, both to the operator and the dealer, and some of the dealers who are urged to take in coal at attractive prices state that they cannot collect enough money to even pay the freight. The steam sizes continue to follow in the trend of the other low prices and can readily be bought at from 10c. to 25c. off the circular. However, the small steam users who have been accustomed to buy their fuel as needed at the prevailing market prices are becoming a little uneasy over the labor outlook and are asking for contracts. Even with offerings at extremely low prices, many of the dealers are declining to buy from the individuals, placing what few orders they have with the larger companies, whom experience has taught them can take care of them in times of trouble in the mining region.

Reports are coming in daily from the mining regions that the men are prepared for the strongest fight—should it come to that—they have ever made. A suspension of two months would benefit the business, as such a condition would enable the market to right itself as to the extremely low prices that have been prevailing for a long time.

The prices ruling the past week, to which should be added the state tax of 2½% per ton, are as follows:

	City	Tide		City	Tide
Broken.	\$3.20	\$4.45	Pen.	\$2.50	\$3.25
Egg.	3.45	4.70	Buckwheat.	1.25	2.25
Stove.	3.70	4.70	Rice.	.85	1.75
Chestnut.	3.85	4.95	Barley.	.50	1.50

Bituminous—The bituminous trade has probably experienced its worst week so far this summer. Mines are on very short time, with practically no demand except on contracts. This continued inactivity of the domestic market has led some of the operators who have never touched export trade to inquire into the possibilities of that line, and it is altogether likely that there will be stronger competition for this trade in the future. The tide shipments this week have continued in good volume to both European and South American ports and the prospects are that the tonnage will continue to increase, although the lack of vessels continues to be more than ever a serious question.

The prevailing prices are as follows:

Georges Creek Big Vein..	\$1.65@1.75	Fairmont gas, mine-run..	\$1.15@1.25
South Fork Miller Vein..	1.50@1.60	Fairmont gas, slack.....	.65@.75
Clearfield (ordinary)....	1.00@1.20	Fairmont lump, ordinary.....	.85@.95
Somerset (ordinary)....	1.00@1.15	Fairmont mine-run.....	.75@.85
West Va. Freeport.....	.85@.95	Fairmont slack.....	.45@.50

While prices are not quotably changed except on slack the market seems to be firmer all around, at the following levels for prompt coal: Slack, 50@55c.; nut and slack, 90@95c.; nut, 95c.@\$1; mine-run, \$1@1.05; $\frac{3}{4}$ -in., \$1.10@1.15; 1 $\frac{1}{4}$ -in., \$1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 the market on mine-run seems to be from \$1.05 to \$1.15.

BUFFALO

Increased activity in bituminous and still more anticipated soon. Price advances will be slow as the natural output is large and all operators are eager to increase their trade. No improvement yet in anthracite.

Bituminous—The volume of bituminous moving appears to be steadily increasing and there should be a constant improvement from now until fall. Grain will soon begin to move and it is expected that there will be enough demand on the railroads to affect coal. There is no better call for slack, but there are not quite so many reports of cut prices and the general improvement is no doubt helping it some.

The Canadian situation is not materially improved; in fact the latest report from there notes the shutdown of a mill that had for a long time bought coal in considerable quantity here. The additional tariff, the reduction in the price of Canadian coal and the lessened consumption, all contribute to cutting down sales in that direction. Prices continue on the basis of \$2.70 for best Pittsburgh lump, \$2.55 for three-quarter, \$2.45 for mine-run and \$2.25 for slack, with slack less firm than sizes.

Anthracite—The demand does not improve. All branches of the trade appear to be dull now, so that the mines have no other alternative than to run slow and they are turning out less coal than for a long time. There is a fairly good report from some of the independent mines. By making an extra effort to push their coal on the road and by preparing it as well as they can, they are able to keep running. If they can do that now they should do a fair trade till the fall demand sets in.

There is considerable dropping off in Lake shipments which, till within a week or two, had kept up well. There is report that storage space is short at the receiving ports. The vessels have loaded only 80,900 tons here during the past week.

TOLEDO

Pocahontas supply still less than the demand and prices are holding to list. Domestic and steam grades slow. Lake movement still light.

A little stronger Lake market and other lines at a standstill are the salient features of the local market. Domestic trade is slow and even the anthracite movement is extremely light in spite of the fact that this is the period when contract coal is usually being put in. The threshing season is now on full with one of the biggest crops known in this section, but the additional demand has scarcely been noticed.

Kentucky coal seems to have held up as well as anything in the domestic lines. Anthracite is selling off the circular, which is an unheard of situation at this point. West Virginia prices are so low that they are moving the best; Pocahontas No. 3 is the exception this grade holding at full list prices. The Lake shipments are holding up well and there was a little spurt during the past week due to the regular August increase in the circular. There is little demand for smokeless coal outside of the Pocahontas grades and the situation is generally weak. Little Youghiogheny is sold on this market and Pittsburgh No. 8 is going at the buyers' price.

COLUMBUS

Production shows no increase and conditions are generally unsatisfactory. Buyers cautious and a reaction in prices seems imminent. Lake movement a big disappointment.

Efforts to force the backward stocking season are not meeting with much success in the case of the domestic coals. Production in Ohio fields has increased little, if any. West Virginia and Kentucky operators also, find conditions very unsatisfactory in this market. Under these circumstances there is considerable sacrifice of prices.

There is a slightly better feeling in the steam trade most factories working better time than during the first half of the year. This is offset in a measure by the cautious buying of public service plants and other large consumers, particularly in the matter of fine coal. The opinion is generally held that prices, which have so far been well maintained are going to break in the near future. The production of domestic lump will be much increased shortly, owing to limited stocking up to the present time, and this will create a surplus of screenings. Absence of any large Lake shipments either in the Hocking Valley or Eastern Ohio has been a big factor in holding up West Virginia nut, pea and slack to from 15 to 20c. above normal.

It now seems almost a certainty that the Hocking valley will have no Lake season in the real sense of the word. Beginning at about this date last year, when the new mining scale was signed, about 600,000 tons were sent to the docks before navigation closed. The dock movement at Toledo is slow. During the week ending July 19 but 51,069 tons were handled. The total tonnage for the season up to that date is 961,462. Slow movement by rail to the interior in the Northwest still keeps the upper docks in a congested condition.

Prices in Ohio fields are:

	Hocking	Pomeroy	Kanawha
Rescreened lump.....	\$1.50	\$1.60	
Inch and a quarter.....	1.35	1.35	\$1.30
Three-quarter "nch.....	1.25	1.30	1.25
Nut.....	1.15	1.25	1.15
Mine run.....	1.10	1.10	1.05
Nut, pea and slack.....	.70	.75	.65
Coarse slack.....	.60	.70	.55

Mines have been working at about the following percentages of full capacity.

District	Week Ended				District	Week Ended			
	July 3	July 10	July 17	July 24		July 3	July 10	July 17	July 24
Hocking....	25	20	25	25	Cambridge.	20	25	35	25
Jackson....	25	15	25	20	Masillon...	15	25	30	25
Pomeroy....	30	45	40	40	Eastern O.	40	60	50	55
Crooksville.	55	30	20	20	Average..	30	31	32	30

CINCINNATI

Improving demand for prepared grades, especially for the Lake ports, but steam business is still slow, with virtually no market.

A slightly improved domestic market is noted and the Lake movement is also picking up quite perceptibly. The certainty of a normal domestic consumption is moving the coal, although the volume is restricted. The market, however, is still very far from normal. The increased production of screenings resulting from the domestic improvement has weakened the steam market still further and heavy price concessions are noted both on contract and spot coal. While the machine-tool and related lines are running overtime, as a result of war orders, few other manufacturers have much to do.

CLEVELAND

Coal receipts increased somewhat, but prices continue firm and slightly stronger on fine coal. Retailers book orders for number of orders ahead.

Receipts of coal are larger than at the opening of last week, but the demand pretty well cleaned up the market Monday. Pittsburgh coal brought \$1.55 and Youghiogheny as high as \$1.65. Sales for shipment are being made at slightly better prices, and the demand for fine coal seems to be growing. The large steam consumers who have been dependent upon orders for war materials are continuing to take as much fuel as they have been and manufacturers of lines not sold as war material are taking a little more coal.

The demand for coarse coals continues light. The market has been cleaned up and the low priced Ohio No. 8 that was offered a week ago has disappeared. There is some West Virginia No. 8 at \$1.80 for three quarter, but not enough to distract prices.

The Lake business shows no change; it will be three weeks at least before it begins to increase.

Retail dealers are booking considerable business, but the delivery is being delayed as customers are not taking the coal. There seems to be no hurry to take coal that commands a discount for delivery and payment prior to Sept. 1.

Quotations for shipment are:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	Ohio No. 8
Lump.....	\$3.45				
Lump, $\frac{1}{4}$ in.....		\$2.15	\$1.90	\$1.85@1.90	\$1.85@1.90
Egg.....	3.45				
Mine run.....	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack.....		1.60	1.55	1.55	1.55

LOUISVILLE

Mine operations continue much curtailed. Substantial cut in retail prices being considered.

Negative conditions continue in the Kentucky coal trade, with little or no improvement in any direction. Mines in Eastern Kentucky are reported to be averaging from two to three days a week, while those in the western part of the state are making about a day less. The demand from the cotton seed crushing mills in the South is developing, but the ice factory trade throughout the whole section is less than normal. The retail stocking movement is not a big item, as yet, and it is stated that a sharp reduction in the retail price is to be made.

Prices, f.o.b. mines are based on from \$1.35 to \$1.90 for block, while nut and slack range 30 to 40c. and 50 to 60c. according to grade. Western Kentucky screenings are to be had in considerable quantities.

COKE

CONNELLSVILLE

Better outlook, additional merchant furnaces being expected to blow in, and quotations are stiffer. Production and shipments approximately the same as at the beginning of the month.

Prospects have improved for an increased demand for furnace coke as the pig-iron market has taken such a turn as to suggest that several additional furnaces will soon blow in. Elia furnace at West Middlesex, controlled by Pickands Mather & Co., is expected to blow in early in August, while the third of the Shenango furnaces is likely to go in at about the same time.

An Eastern consumer has contracted for 6500 tons of furnace coke a month for three months, the price being in the neighborhood of \$1.75. For longer delivery periods the operators are disposed to quote on a sliding scale basis, depending on the price month by month of basic pig iron at valley furnaces. Spot furnace coke has stiffened again as shipments on contracts are somewhat better and there is little free coke available. We quote: Prompt furnace, \$1.70; contract furnace to Oct. 1, \$1.75; contract furnace to Jan. 1, \$2; prompt foundry, \$2.25 @ 2.40; contract foundry, \$2.25 @ 2.60, per net ton at ovens.

The "Courier" reports production in the Connellsburg and lower Connellsburg region in the week ending July 17 at 371,144 tons, an increase of 30,402 tons, and shipments at 365,615 tons, an increase of 35,542 tons. The increases represent the recovery after the holiday week.

Buffalo—There is some advance in the price of coke, though it does not appear to have materialized in this market to any great extent. So long as steel continues to do well there will be a liberal output of coke, though prices may not be very strong. There is frequent report of new ovens firing up, which shows confidence in the market, though it is easy to overdo it. Quotations are stronger on the basis of \$4.25 for best Connellsburg foundry and \$3.30 for stock coke.

Chicago—Coke prices have shown somewhat of a tendency to stiffen during the past week, with the greatest strength in foundry sizes. Byproduct sizes are in better demand, and prices have steadied. Quotations are as follows: Byproduct, \$4.55 @ \$1.10; Connellsburg, \$4.75 @ 5; Wise County, \$4.65; gas coke, \$3.75 @ \$3.90, furnace, \$4.65 @ 4.75.

MIDDLE WESTERN

GENERAL REVIEW

Demand quiet with prices fairly well maintained. Screenings slightly softer. Anthracite still backward.

Midsummer dullness has prevailed this week, and the expected revival of buying over the month end has not materialized. There is but little spot coal on tracks. Shipments to the country districts have not been so large as expected, due to the backwardness in the crops. General commercial conditions show betterment, but extreme conservatism prevails in the retail trade and among large industrial buyers.

Prices are holding firm because of the close restriction of shipments, although some operators state that current quotations do not allow them sufficient margin to show a reasonable profit. Nevertheless, it is admitted that prevailing prices are better than they were at this time last year. It is anticipated that August orders will be larger and at better prices, because of the small shipments thus far. The movement of Lake coal has increased during the past two weeks.

CHICAGO

Market somewhat heavier and prices lower. West Virginia grades continue the leaders. Anthracite unusually weak.

Franklin and Williamson County domestic shipments have been smaller this week, and it is reported that some coal has gone forward at from 10c. to 15c. per ton under circular prices, although generally the \$1.50 price is maintained. Saline County domestic lump usually sells at \$1.35, but an increasing number of shipments are noted from Williamson County at \$1.25. Most of the screenings from Southern Illinois mines have been averaging 75c. per ton.

In the Springfield district orders for domestic lump have been very slow, although the operators are endeavoring to maintain the \$1.50 price. It is reported that a number of sales have been made at 25c. under this figure during the past week. Screenings from the Springfield district have been steady at around 70c.

The output of Indiana domestic coals has increased slightly. Industrial shipments from the Indiana mines show little betterment, but the operators are confident that the fall trade will bring a decided revival in this class of business. The demand for Fourth Vein Indiana coal has been steady at fair prices, while Fifth and Sixth Vein grades have been very quiet. Some shipments for threshing trade have been moving to Iowa and Northwestern points.

Prepared sizes of Pocahontas and West Virginia smokeless coals continue strong, egg coal being easier than the others. Mine-run has stiffened, and most of this grade is selling at \$1.25. Splint coals show no improvement, and prices quoted show a wide range. Splint nut and slack has been as low as 45c. per ton, f.o.b. cars at the mines for spot shipment.

The Pennsylvania smokeless demand has receded, but there is no demurrage coal to be absorbed. The demand for egg and nut has been very slow.

The circular price for Hocking lump is \$1.50, but to meet the strong competition from West Virginia and Kentucky coals, shipments have been going forward at an average discount of 25c.

Kentucky grades are still in a bad way. The demand for Kentucky block has been more active, but there is practically no movement of other sizes.

Anthracite is fully as backward as bituminous grades. Lake shipments have declined in volume, being much less than for several weeks past. Shipments to far Western points have been made this week at discounts of from 25c. to 35c.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump.....	\$1.35@1.50	\$1.25@1.50	\$1.35@1.50	\$1.25@1.50	\$1.40@1.50
Steam lump		1.15@1.25	1.10@1.15	1.15@1.25	1.15@1.25
2½-in. lump	1.25		1.25@1.35	1.25@1.35	1.30@1.35
1½-in. lump		1.25	1.20@1.30	1.15@1.25	
Egg	1.25@1.50	1.25@1.35	1.15@1.25	1.10@1.15	1.15@1.25
Nut	1.25@1.35	1.10@1.25	0.95@1.05	0.90@1.05	1.00@1.05
No.1 washed	1.25@1.50		1.45@1.50		
No.2 washed	1.25@1.35		1.35@1.40		
No. 1 nut	1.35@1.50				
No. 2 nut	1.25@1.35				
Mine-run.....	1.15@1.25	1.00@1.10	0.85@.95	0.90@1.00	0.85@1.05
Screenings.....	70@ .80	65@ .75	60@ .75	65@ .75	70@ .80
<hr/>					
Harrisburg					
& Saline Co. E. Kentucky W.Va. Smok'l. Smokeless					
Lump.....	\$1.25@1.35	\$1.35@1.75	\$1.90@2.00	\$1.40@1.60	\$1.35@1.50
1½-in. lump	1.10@1.25	1.25@1.50	1.25	1.25	1.25@1.35
Egg	1.25@1.35	1.10@1.35	1.75@1.90	1.35@1.50	
Nut	1.25@1.35	0.90@1.10	1.40@1.60	1.25@1.35	1.15@1.25
No. 1 nut	1.25@1.35				
No. 2 nut	1.25@1.35				
Mine-run.....	1.10@1.15	1.00@1.15	1.15@1.25	1.00@1.25	1.15@1.25
Screenings.....	65@ .75	65@ .75			

Receipts by Lake—Arrivals by Lake for the week to July 26 and for the month and season to date were as follows:

From	1915		1914	
	Anthracite	Bituminous	Anthracite	Bituminous
Buffalo.....	13,642		26,060	8,400
Toledo.....		10,023		20,500
Ashtabula.....		2,400		
Cleveland.....		5,546		
Oswego.....			2,348	
	13,642	17,960	28,408	28,900
July total to date.....	105,153	45,674	111,627	69,898
Season total to date.....	363,399	209,244	282,880	325,987

INDIANAPOLIS

Screenings are lower, the supply exceeding the demand temporarily. Retailers more active. Steel and related industries very busy and consuming large quantities of coal.

An easing off in the price for screenings is the only feature of interest in the Indiana coal industry. Nos. 5 and 6 are now selling at 65 to 70c. Operators are unable to account for this, though the cause apparently lies in Chicago. The buying there is not constant and if big purchasers stay out of the market for a few days, the effect is immediately noticeable. During these periods, the supply exceeds the demand and some sellers, alarmed by the surplus, are tempted to make concessions.

The demand for domestic lump is slightly better, the retail yards having been forced to replenish supplies. The movement as yet to the railroads has not shown the acceleration due to crop-marketing times, as yet the weather having been a delaying factor. The activity at Gary, Kokomo, Anderson and other cities where there are steel manufactories has increased. At Kokomo, where the auto factories are working on war, as well as domestic business, the factory buildings are not adequate and tents have been erected. Retailers report an increasing movement to consumers' bins.

ST. LOUIS

Some domestic coming in but screenings continue to drag. Mt. Olive mines suspend operations for 30 days.

Domestic orders are beginning to come in for lump and egg coal, cutting off the demand for nut, which has become a drug on the market. Screenings are still at the bottom of

the price list for some unexplained reason. The Mt. Olive mines are closed down for thirty days and consumers of this grade are being supplied with Staunton coal. There have been numerous changes in prices during the past week and quotations are now as follows:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump.....	\$1.25@1.35	\$1.25	\$1.25@1.35	\$0.95
2-in. lump.....	.95	1.25	.85	
3-in. lump.....		1.25@1.35		.85
3x6 egg.....	1.25@1.35			
No. 1 nut.....	1.15@1.20			
No. 2 nut.....	1.00@1.05			
No. 1 washed.....	1.35		1.35	
No. 2 washed.....	1.25			
No. 3 washed.....	1.15			
No. 4 washed.....	1.10			
No. 5 washed.....	.80			
Screenings.....	.65@ .75	.70		.65@ .70

KANSAS CITY

The retail market has shown very little activity during the past week, though it has picked up to a slight extent. It is understood that prices will be advanced on the first of August. The wholesale market has been slightly better and retailers are pushing strong for business by energetically advertising their product.

Prices for July delivery are as follows:

Bonanza smokeless (semi-anthra-	Penn. anth. (furnace).....	\$10.50
cite).....	Penn. anth. (stove).....	11.00
Cherokee lump.....	4.25 Arkansas anth. (furnace).....	8.00
Cherokee nut.....	4.00 Arkansas anth. (stove).....	8.50
Missouri block.....	4.00	

PRODUCTION AND TRANSPORTATION STATISTICS

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for May, 1914-15, and for the eleven months ending April, 1913-14-15, in long tons:

Imports from:	May		Eleven Months		
	1914	1915	1913	1914	1915
United Kingdom	551	957	8,750	10,684	33,919
Canada.....	55,410	77,213	1,255,854	938,182	1,036,285
Japan.....	410	4,510	78,812	83,851	77,490
Australia and Tasmania.....	3,136	6,040	140,825	230,081	160,947
Other countries	183	420	3,257	3,613	2,248
Total.....	59,690	89,140	1,487,498	1,256,411	1,310,889
Exports:					
Anthracite					
Canada.....	469,441	412,479	4,131,075	3,469,646	3,269,000
Uruguay.....	6,042	10,215	73,741	56,119	60,552
Total.....	475,483	422,694	4,204,816	3,525,849	3,329,552
Bituminous					
Italy.....		285,027		1,245,260	
Canada.....	705,562	589,512	10,563,330	10,678,541	7,551,864
Panama.....	22,150	34,321	443,249	336,617	295,664
Mexico.....	20,951	30,247	406,249	280,526	369,166
Cuba.....	82,851	107,650	1,167,681	1,048,379	990,222
West Indies.....	50,824	34,471	550,055	532,108	413,486
Argentina.....	11,078	108,730	.....	129,432	406,058
Brazil.....	16,391	65,183	.....	229,059	404,780
Uruguay.....	11,581	14,401	.....	56,252	91,671
Other countries	162,425	134,735	1,060,966	1,228,486	711,414
Total.....	1,083,813	1,404,277	14,191,530	14,519,400	12,479,585
Bunker coal....	674,805	647,918	6,666,494	7,124,527	6,334,773

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during June and the past four months in short tons:

	March	April	May	June
Pocahontas Field.....	1,003,437	1,163,948	1,259,992	1,493,776
Tug River District.....	282,886	285,243	322,881	348,737
Thacker District.....	227,817	245,857	278,775	238,688
Kenova District.....	66,605	112,076	90,642	81,794
Clinch Valley District....	144,031	138,970	144,576	155,689
Other N. & W. Territory	2,478	3,271	2,323	3,418
Total N. & W. Fields..	1,727,254	1,949,395	2,099,189	2,322,102
Williamson & Pond Creek	48,052	55,311	84,086	75,573
All other railroads.....	129,446	195,845	251,339	282,790
Grand total.....	1,904,752	2,200,551	2,434,614	2,680,465

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during June and the previous two months:

	April		May	
	1915	1914	1915	1914
Coal.....	2,159,914	2,131,812	2,564,481	2,357,119
Coke.....	289,369	343,962	297,897	301,163
Total....	2,449,283	2,475,774	2,862,378	2,658,282
	1915	1914	1915	1914
			1915	1914

I. C. C. Decisions

I. C. C. Nos. 5919, 5920—Alpha Portland Cement Co. vs. Baltimore & Ohio R.R. Co., et al. Baltimore & Ohio R.R. Co., et al. vs. Pennsylvania R.R. Co.

1. Rate of \$2 per gross ton for the transportation of bituminous slack coal in carloads to Martins Creek, Penn., from mines in the Fairmont region of West Virginia and in the Westmoreland region of Pennsylvania, not found to be unreasonable or unjustly discriminatory.

2. The requirement of a differential between slack and other sizes of bituminous coal not found to be justified.

I. C. C. No. 6796—San Toy Coal Co. vs. Akron, Canton & Youngstown Ry. Co., et al.

1. Complainant attacks as unreasonable and unduly discriminatory defendants' rates on bituminous coal in carloads from San Toy, Ohio, and other points in the Crooksville, Ohio, coal district to Chicago, Ill., and to points in the states of Illinois, Indiana, and Michigan. Upon the facts disclosed of record: Held, That the rates unjustly discriminate against shipments from mines of complainant and others located in the same district in favor of mines located in the middle district of Ohio. Defendants required to remove the discrimination.

2. Complaint is also made of rates from San Toy and other points in the Crooksville district to Lake Erie ports for transhipment; Held, That the evidence fails to show that the rates complained of are unreasonable or otherwise in violation of law.

I. C. C. No. 6271, Monroe Coal Co. et al. vs. Chicago & Eastern Illinois Ry. Co. et al.

Rate of 87c. per ton on coal to Chicago from mines in the Sullivan-Linton group of Indiana found not to be unduly discriminatory as compared with the rate of 77c. applicable to the same destination from mines in the Brazil-Clinton district of Indiana. (For a detail analysis of the Illinois and Indiana freight rates see p. 1056 of Vol. 7.)

I. C. C. No. 7408—Reeves Coal Co., vs. Pere Marquette R.R. Co., et al.

A shipment of bituminous coal en route from La Follette, Tenn., to Vermilion, S. Dak., was ordered reconsigned to Ghent, Minn. Defendants failed to effect the reconsignment, and higher charges were collected than would have accrued if complainant's instructions had been followed. Reparation awarded.

FOREIGN MARKETS

GREAT BRITAIN

July 16—The two important events of the week in the coal industry have been the issue of the text of the new Price of Coal (Limitation) Bill, which has naturally been freely and widely discussed, and the strike of the miners in South Wales. Both have interfered with business materially. With regard to the former, the announcement in the House of Commons yesterday disposes of the controversy as to whether the Bill applies to coal not yet delivered under existing contracts. It does not. Contracts made before the passing of the Act are unaffected by it. As for the strike in South Wales, a speedy resumption of work is expected, but it is pointed out that should the men prove deaf to the appeals of patriotism and reason the Government, while unable to punish thousands in any other way might lay an embargo upon the funds of the unions, and make it penal to either distribute or receive money which there is reason to believe is to be used for strike pay. The stoppage of supplies should prove a potent check to the strikers if such action becomes necessary.—"The Iron & Coal Trades Review."

July 16—The whole of the Welsh coalfield being on top since yesterday, business has come to a standstill. Hopes are entertained that better counsels will prevail, and that the meeting today between the Government and the representatives of both sides will be the means of arranging matters so that work can be resumed at once. Quotations are nominal.

Freights—Chartering is, if course, also at a standstill, but some little business is being done in anticipation of an early settlement of the dispute. Rates are approximately as follows:

Gibraltar.....	\$3.84	Naples.....	\$5.37	St. Vincent.....	\$4.80
Marseilles.....	4.64	Alexandria.....	6.00	Rio de Janeiro.....	6.72
Algiers.....	4.27	Port Said.....	5.88	Monte Video.....	6.00
Genoa.....	5.28	Las Palmas.....	4.56	River Plate.....	6.24

Financial Department

Lehigh Coal & Navigation Co.

President S. D. Warriner reports for the year 1914 as follows:

As a result of the inauguration of operations at the new power plant of the Lehigh Navigation Electric Co., the Lansford power house of your company has been closed and power is now being purchased from the Lehigh Navigation Electric Co. The increased amount of current available has permitted a more complete electrification of the plants of your company at points where economies may be realized. An electric hoist has been installed at No. 5 Shaft and is now in successful operation. The new shaft at Rahn Colliery has been equipped with two sets of electric hoisting apparatus, and electric pumps and air compressors are being installed. On the completion of this installation, the boiler plant at this colliery will be abandoned. The increased use of electric fans has allowed the abandonment of long steam lines, thereby securing material economy.

RESULTS FOR CALENDAR YEARS.

	1914—Gross	1913	1914—Net	1913
Coal.....	\$12,115,852	\$11,279,914	\$761,374	\$464,746
Canals.....	211,627	213,490	loss 35,160	loss 57,645
R.R. rentals received.....	2,608,103	2,646,414		
Investments.....	902,621	441,802	3,315,405	3,328,727
Miscellaneous.....	329,852	713,067		
Total.....	\$16,168,055	\$15,294,687	\$4,041,619	\$3,735,828
General administrative expenses.....		134,694	136,656	
General taxes.....		233,251	232,459	
Interest on funded debt.....		1,175,567	953,034	
Other interest.....		14,528	41,168	
Dividends paid (8%).....		2,124,636	2,124,636	
Balance, surplus.....		\$358,943	\$247,875	

BALANCE SHEET DEC. 31

	1914	1913	1914	1913
Assets	\$	\$		
Coal lands, mines and property.....	18,256,963	17,456,799	Capital stock.....	26,587,650
Canal property.....	3,403,479	3,414,857	Funded debt.....	30,668,000
Real estate.....	1,055,934	1,018,753	Loans and acc'ts pay.....	26,515,333
Physical property.....	16,048,549	16,847,133	Audited vouchers and payrolls.....	967,993
Securities pledged.....	12,973,072	7,988,311	Sundry creditors.....	909,550
Securities unpledged.....	4,375,438	6,286,786	Matured bond interest.....	33,089
See, uncontrolled cos. pledged.....	432,750		Accrued taxes.....	884,059
Cos. securities pledged.....	2,199,000	3,399,000	Accrued bond interest.....	402,072
Bonds and stocks in treasury.....	x1,845,700	423,513	Mat. and acr. rents.....	177,301
Sec. of uncontr. cos.....	638,066		Divs. unclaimed.....	569,568
Cash.....	1,334,696	984,444	Susp. credit items.....	378,156
Customers' ac'ts.....	1,680,470	1,231,306	Deprec. and other res.....	53,614
Coal stock.....	1,697,166	1,188,295	Total.....	60,895
Materials and supplies.....	336,707	383,976	Total.....	2,828
Sundry debtors.....	606,587	512,958	Total.....	2,802
Miscellaneous.....	4,538	25,813	Total.....	7,633
Susp. deb. items.....	569,634	281,161	Total.....	6,991
Total.....	66,387,933	62,513,921	Total.....	107,581

Includes stocks in treasury, \$29,700 yearly, and bonds in treasury, \$1,816,000 in 1914 against \$393,813. y After adding sundry accounts adjusted, \$146,763.

The sales of coal during 1914 amounted to 3,572,641 tons, an increase of 43,547 tons compared with the year 1913. Market conditions in 1914 were not satisfactory, owing in part to the mild weather during the early months of the year, and while mining was continued during the summer with a due degree of steadiness, in the latter months an over-production in the market caused more or less suspension of mining operations. The slight increase in the sales of coal for the year, in the face of the unfavorable market conditions, was due to the energetic development of additional markets for your company's coal.

The net revenue derived from coal during the year was \$50,373, an increase of \$296,627 as compared with 1913. This increase was due to the economies realized in the more efficient operation of your company's mines as well as to the higher average rate of production per breaker hour operated.

The production of coal in 1914 from the lands of the Alliance Coal Mining Co., in which your company owns a substantial interest, was limited entirely to the operations of the tenants of that company under lease, the operation of

Note—For previous annual report of this company see Vol. 5, p. 754.

the Alliance Colliery having been suspended throughout the year.

The total tonnage carried on canals during the season of 1914 was 349,586 gross tons, of which 242,587 gross tons were anthracite coal. There were 14,321 gross tons more of anthracite coal transported in 1914 than in 1913, and 17,976 gross tons more of miscellaneous tonnage, the latter increase being due to increased shipments of coal recovered from pools in the Lehigh River. The net loss resulting from canal operations for the year was \$35,160, as compared with a net loss of \$57,645 for the year 1913. The amount charged to operation on account of depreciation of plant and property was \$18,992, as compared with \$18,000 in 1913.

As mentioned in the last annual report, the Panther Creek R.R., formerly operated by your company in the Panther Creek and Nesquehoning Valleys, was sold to the Panther Creek R.R. Co., which was subsequently merged and consolidated with the Lehigh & New England R.R. Co. Your company is, therefore, no longer engaged, directly or indirectly, in the railroad transportation business.

During the year, your company increased its holdings of Lehigh & New England R.R. Co. stock by the purchase of 27,100 shares, and now owns 119,950 shares of the par value of \$5,997,500. Dividends on this stock aggregating \$425,600 were received during the year; this amount, together with the rentals paid by the Central R.R. Co. of New Jersey, and other dividends and interest received upon railroad stocks and bonds owned by your company are included in miscellaneous revenues.

The construction of the Lehigh Navigation Electric Co.'s power plant at Hauto, Penn., and its sub-station at Siegfried, Penn., together with the main transmission and distribution lines, was completed and placed in full operation on May 1, 1914. The plant is being operated steadily at about half its capacity, producing an average of over 200,000 kw.-hr. per day, which is sold to consumers with which connections have been made during the year. The amount of power sold is gradually increasing, and negotiations are under way which it is hoped will soon provide a market for the entire capacity of the present installation.

X

The Consolidation Coal Co. in 1914

Retiring directors of the Consolidation Coal Co. were re-elected at the annual meeting of the stockholders. Under the company's charter the stockholders also vote directly for officers, who were re-elected as follows: President, J. H. Wheelwright; vice presidents, F. S. Landstreet and G. T. Watson, and chairman, C. W. Watson. There was no other business transacted. No reference was made to Rockefeller interests.

The annual report for the year ended Dec. 31, 1914, showed the income account as follows:

	1914	1913	1912
Total income	\$14,828,980	\$15,443,246	\$14,520,416
Net	3,392,645	3,826,703	3,746,890
Interest and sinking fund	1,382,913	1,366,974	1,243,531
Balance	*2,009,732	2,459,729	2,503,357
Dividends	1,500,000	1,500,000	1,358,865
Surplus	509,732	959,729	1,144,492
Previous surplus	8,774,252	7,814,523	7,014,023
Less adjustments	70,656		
Total surplus	9,213,328	8,774,252	8,159,415

*Equal to 8.03% earned on \$25,000,000 capital stock outstanding, compared with 9.8% earned in 1913.

The balance sheet of Dec. 31, 1914, shows total assets \$74,782,841, of which coal lands, mining and railroad equipment owned is valued at \$53,915,030. Stock and supplies on hand amount to \$1,607,862, bills and accounts receivable \$5,955,452 and cash on hand \$1,555,227. In its liabilities the company includes \$25,000,000 outstanding capital stock and \$6,190,500 stock authorized but not issued, and bonded indebtedness is \$29,916,000. Bills payable amount to \$2,782,633.

In 1914 the total tonnage of bituminous coal mined by the company and its subsidiaries was 9,562,515 gross tons, a decrease of 397,296 from 1913. Coke manufactured last year amounted to 58,202 tons, a decrease of 17,848 from 1913. Coal mined by lessees in 1914 totaled 479,971 gross tons, 271 less than in the previous year.—"Philadelphia News Bureau."

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
944	Brighton Foundry Co.	Chicago	Ill.	40	
945	Butler Bros.	Chicago	Ill.	2500b	40
945	Butler Bros.	Chicago	Ill.	2500a	40
946	Artesian Stone & Lime Wks.	Chicago	Ill.	40	
948	Co-operative Ent. Glass Co.	No. Vernon	Ind.	500b	40
949	The Acme Malting Co.	Chicago	Ill.	2 (cars) ¹	40
952	Fairport Municipal Com.	Fairport	N. Y.	2000b	40
953	Board of Education	Lynn	Mass.	2057b	40
954	Light & Water Dept.	Port Gibson	Miss.	1600b	40
955	Manistein Flour Mill Co.	Manistein	Mich.	40	
956	Abbott Lt. & Power Co.	Petersburg	Ill.	3200b	41
958	Electric Works	Washington	Ind.	5000b	41
960	Harriman Water & L. Dept.	Harriman	Tenn.	2160b	41
973	Board of Education	St. Cloud	Minn.	300b	41
990	General Hospital	Kansas City	Mo.	100b	76
998	Water Works Dept.	Kansas City	Kan.	20,000b	77
1003	Wesley Hospital	Kansas City	Mo.	150b	77
1005	Board of Education	Cleveland	Ohio	2800a	77
1005	Board of Education	Cleveland	Ohio	36,000b	77
1006	Proctor & Gamble Mfg. Co.	Kansas City	Kan.	200b	77
1018	Kelley Milling Co.	Kansas City	Mo.	20 (tons) ²	77
1021	Western Sash & Door Co.	Kansas City	Mo.	20 (cars) ³	77
1030	Spalding's Col.	Kansas City	Mo.	10 (cars) ³	115
1032	Board of Education	Cleveland	Ohio	300a	115
1032	Board of Education	Cleveland	Ohio	38,500b	115
1050	Baker & Lockwood	Kansas City	Mo.	6 (cars)	116
1065	Board of Education	Kansas City	Kan.	2000b	116
1080	Morris & Co.	Kansas City	Mo.	750b	117
1084	Board of Education	New Lexington	Ohio	117	
1086	Deputy T. Jennings	Clinton	Mo.	117	
1093	City Government	Franklin	Pa.	2400b	117
1096	Montgomery Ward & Co.	Kansas City	Mo.	6000b	157
1098	Board of Education	Huntingdon	Penn.	250b	157
1103	Michigan Farm Colony	Wahjamega	Mich.	20 (tons) ³	157
1103	Michigan Farm Colony	Wahjamega	Mich.	100a	157
1104	Borough School Bd.	Springdale	W. Va.	4000	157
1116	Board of Education	Windsor	Mo.	158	
1124	Board of Education	Ipswich	Mass.	100a	158
1124	Board of Education	Ipswich	Mass.	200b	158

¹ Per week. ² Per day. ³ Per month. a Indicates anthracite coal b Indic-
ates bituminous.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

+No. 801—Henderson, Ky.—Two bids have been received on this contract (Vol. 7, pp. 1005, 1126), which provides for furnishing the Municipal Electric Light Plant with about 9000 tons of coal. The Peoples Coal Co., which operates in this immediate vicinity, has bid \$1 per ton, and the St. Bernard Mining Co. 85c. A severe fight is being made to award the business to the Peoples company because of the fact that a great many of the miners working for that concern are residents of Henderson. The question is now in the hands of a committee which will probably act on it shortly. Address Supt. L. P. Hite, Municipal Light Station, Henderson, Ky.

+No. 848—Chicago, Ill.—While it was expected that awards on this contract (Vol. 7, p. 1049), which provides for furnishing the local Board of Education with its fuel requirements during the ensuing year, would be made on July 2, the matter was deferred until July 7, and on that date was again deferred for an additional two weeks. No information can be obtained as to when the contract will finally be placed. Address Secy. L. E. Larson, Bd. of Edu., Tribune Bldg., Chicago, Ill.

No. 894—Richmond, Ind.—All the bids submitted on this contract (Vol. 7, p. 1086), which provides for furnishing the Board of Public Works with approximately 10,000 tons of nut and slack coal, have been rejected. Requests for new bids will be readvertised. Address Pres. Alfred Davis, Bd. of Pub. Safety, Richmond, Ind.

+No. 905—Logan, Ohio—Bids have been received on this contract (Vol. 7, p. 1126), which provides for furnishing the local Board of Education with approximately 400 tons of coal, as follows: Charles Vories, 1½-in., screened, \$2; Hocking Valley Brick Co., 2-in., screened, \$2.15; Barthelson & Son, 1½-in., screened, \$2.10; Richard Barthelson, 1½-in., screened, \$2.12½; Helm Clay Products Co., 1½-in., screened, \$2.05. Address Clk. Herbert R. Harrington, Logan School Dist., Logan, Ohio.

1010—Kansas City, Mo.—This contract (p. 77), which provides for furnishing the fuel requirements of the Kansas City Soap Co., will be let about Aug. 15 if satisfactory propositions are received, and otherwise the company will continue to buy in the open market. Address H. L. Fettlers, Kansas City Soap Co., Shawnee and Railroad St., Kansas City, Kan.

1068—Pella, Iowa—Bids on this contract will be received until 6 p.m., Aug. 3, instead of July 20, as previously announced (p. 116). Lump, mine-run and steam coal are required and quotations should include cost of delivery in the bin at the light plant. Address City Clk. A. C. Kuyper, Pella, Iowa.

1088—New York, N. Y.—Bids have been received on this contract (p. 117), which provides for furnishing the Department of Bridges with about 250 tons of both No. 1 buckwheat and mine-run coal as follows:

	Buckwheat No. 1	Mine-Run
Burns Bros.....	\$3.25	\$3.30
Gavin Rowe.....	3.48	3.48
John F. Schmadeke, Inc.....	3.51	3.61

Address Bridge Comr. F. J. H. Kracke, Municipal Bldg., New York City.

New Business

+1131—Wellington, Ohio—The Municipal Electric Light Plant at this place usually contracts some time in the fall for their annual requirements of coal aggregating approximately 900 tons of three-quarter lump. The customary price is about \$2.35 per ton, and the business is done on a competitive basis. Address Supt. C. E. Gadfield, Municipal Elec. Lt. Plant, Wellington, Ohio.

+1132—Bloomington, Ill.—The Board of Education at this place received sealed bids until 4 p.m., July 26, for furnishing approximately 1000 tons of bituminous lump coal. The storage capacity of the school buildings is to be filled prior to Sept. 1, and payments will be made Jan. 1 and July 1. The successful bidder will be required to furnish a satisfactory bond for \$6000. Address Chn. R. E. Williams, Bd. of Edu., 602 Peoples Bank Bldg., Bloomington, Ill.

+1133—Springdale, Penn.—The Board of Education will receive bids until 6 p.m., Aug. 3, for furnishing approximately 4000 bu. of mine-run coal to be delivered in the basement of the school buildings. Address W. A. Clowes, Jr., Boro. of School Bd., Springdale, Penn.

+1134—Butte, Mont.—The Board of Education at this place usually receives bids about Sept. 1 for furnishing the coal supply amounting to approximately 3000 tons per year. Lignite coal is used principally and the usual price is about \$4.50 per ton. Address District Clerk, Box 1413, Butte, Mont.

1135—Louisville, Ky.—The annual contract of the Louisville Provision Co. for their coal supply involving about 2000 tons of nut and slack coal expires on Sept. 1. The company requires delivery by wagon. Address J. M. Emmart, Louisville Provision Co., 916 East Market St., Louisville, Ky.

1136—Bloomington, Ind.—The trustees of Indiana University are requesting bids for furnishing the School of Medicine and the Robert W. Long Hospital with coal during the ensuing year. Specifications are on file at both the medical school and the University. Address John W. Cravens, Bd. of Trustees, Bloomington, Ind.

+1137—Jefferson City, Mo.—Sealed proposals will be received until Aug. 2 for furnishing the Missouri State Penitentiary with about 25,000 tons of coal during the year beginning Nov. 1. No. 1 Illinois washed egg coal and 6-in. Missouri and Illinois lump are required. Bids should be made f.o.b. Penitentiary switch. A bond for \$10,000 will be required for the faithful performance of the contract, and all

bids must be accompanied by a certified check for \$1000. Address Warden D. C. McClung, Missouri State Penitentiary, Jefferson City, Mo.

+1138—Cuyahoga Falls, Ohio—Sealed proposals will be received until Aug. 5 for furnishing the local schools with either Pittsburgh, Youghiogheny, or Bergholtz three-quarter lump coal. Bids may be submitted on either one or all three of the buildings involved. Address Secy. H. N. Rook, Cuyahoga Falls School Bd., Cuyahoga Falls, Ohio.

+1139—Marion, Ohio—The Board of Education received sealed bids until noon, July 26, for furnishing about 480 tons of coal required at the different school buildings during the ensuing year. Bids were requested on Hocking, Sunday Creek or Pomeroy domestic lump, or coal of equal quality. Address Clk. Jeanette L. Hutchinson, Bd. of Edu., Marion, Ohio.

+1140—Beaver Falls, Penn.—The School Board at this place will receive bids until 5 p.m., Aug. 1, for furnishing and delivering 1600 bu. of three-quarter inch Pittsburgh forked coal to be rescreened at the car. Address Secy. H. J. Shaefer, Beaver Falls Bd. of School Dir., Beaver Falls, Penn.

1141—Princeton, Ill.—Bids will be received until Aug. 2 for supplying the Court House and Jail with coal during the ensuing year. Address County Clk. James Fletcher, Bd. of Supervisors, Princeton, Ill.

+1142—Sprague, Wash.—The Board of Education will receive bids until Aug. 20 for furnishing 75 tons of washed steam coal and 16 tons of lump coal. Address Clk. J. F. Hall, School Dist. No. 6, Sprague, Wash.

+1143—Spokane, Wash.—The Board of Education at this place usually contracts for their annual fuel requirements some time in August. The call for bids is advertised, and the customary price is about \$5 per ton. British Columbia mine-run coal is used and about 1500 tons is required. Address Board of Directors, School Board, Spokane, Wash.

+1144—Nelsonville, Ohio—The Board of Education at this place will receive bids until noon, Aug. 26, for furnishing the mine-run coal required at the several school buildings during the ensuing year. Address Clk. E. B. Beard, City Bd. of Edu., Nelsonville, Ohio.

+1145—Galesburg, Ill.—The City Government will receive sealed bids until 4 p.m. for furnishing its fuel requirements during the period ending Apr. 30, 1916. Bids for the Poor Departments and other city buildings, excepting the Water and Electric Light Plant, are to include cost of delivery, and bids for the Water and Electric Light Plant are to include delivery to the shed at the water-works. All bidders must furnish a sample lot of the coal they propose supplying sufficient to run the plant 24 hr. A certified check for \$100 must accompany each bid, and the successful bidder will be required to furnish a bond for \$2500. Address City Clk. William L. Boutelle, Galesburg, Ill.

+1146—Wichita, Kan.—The Board of Education at this place usually contracts for their annual fuel requirements some time in August. About 2500 tons of bituminous and semi-bituminous coal is required. Bids on the current contract were as follows, Weir City Coal being bid on exclusively: MHI, \$3; lump, \$4.40; nut, \$3.60; slack, \$2.75 to \$3. Address Board of Education, City Hall, Wichita, Kan.

1147—Philadelphia, Penn.—The Martin & W. H. Nixon Paper Co. at this place usually contract for its annual fuel requirements, involving about 1500 tons of mine-run bituminous, on Aug. 1. The company has a storage capacity for 1000 tons, and deliveries are by rail at the rate of approximately 50 tons per day. Address Pur. Agt. J. O. Hayes, Martin & W. H. Nixon Paper Co., Manayunk, Philadelphia, Penn.

+1148—Tingley, Iowa—The school board at this place received bids until July 23 for furnishing 1000 bu. of Illinois and Centerville coal to be delivered in the bins. Address Secy. H. W. Edwards, Tingley, Iowa.

+1149—Broken Bow, Neb.—Bids will be received until noon, Aug. 10, for furnishing Custer County with its coal requirements during the ensuing year. All bids must be accompanied by a certified check for \$25 and quotations are required on nut coal, f.o.b. sidetrack at Broken Bow. Address County Clk. R. E. Waters, Broken Bow, Neb.

+1150—Muscatine, Iowa—Sealed bids will be received until 1:30 p.m., Aug. 2, for furnishing approximately 400 tons of bituminous coal for use in the County Institutions. Bids should be on four- and six-inch lump coal, f.o.b. cars at Muscatine. About 200 tons must be delivered during August. Address County Audr. H. C. Shoemaker, Muscatine, Iowa.

+1151—New York, N. Y.—Bids will be received until 11 a.m. Monday, Aug. 2, for furnishing and delivering 23,700 gross tons of anthracite and semi-bituminous coal for the Board of Education. Blank forms and further information

may be obtained on application. Address Supt. of School Supplies Patrick Jones, Bd. of Edu., 59th St. and Park Ave., New York, N. Y.

+1152—Minot, N. D.—The School Board of Harmony School District, No. 151, will receive sealed bids till 2 p.m., Aug. 14, for furnishing the coal requirements at School No. 2 of that district during the ensuing year. Address Clk. Cole Larson, School Bd. Harmony School District, Minot, S. D.

+1153—New Philadelphia, Ohio—The Board of Education will receive sealed bids until noon, Aug. 5, for furnishing the coal required at the several school buildings during the ensuing school year. Bids are requested on screened forked coal. Address Clk. A. A. Stermer, Bd. of Edu., New Philadelphia, Ohio.

+1154—Kingman, Kan.—The Board of Education will receive sealed bids until Aug. 2 for furnishing 200 tons of Cherokee nut, one-half the deliveries to be made during August, and the balance during the Christmas vacation. Address Clk. Beulah Russell, Bd. of Edu., Kingman, Kan.

+1155—Harvey, N. D.—The Board of Education will receive sealed bids until 8 p.m., Aug. 2, for furnishing 100 tons of the best grade Hocking Valley coal. Bids are to include cost of delivery in the boiler room at the High School. Address Clk. P. J. Reimer, Bd. of Edu., Harvey, N. D.

1156—Marcus Hook, Penn.—The Pure Oil Co. at this place will receive bids until Aug. 1, for furnishing from 7500 to 10,000 tons of bituminous coal. Address Purchasing Agent, Pure Oil Co., Lafayette Bldg., Philadelphia, Penn.

+1157—Brookings, S. D.—The City Government will receive sealed bids until 8 p.m., Aug. 2, for furnishing the annual coal supply during the ensuing year. Quotations should be made f.o.b. cars at Brookings and deliveries are to be made in box cars. Bids are also requested for hauling the coal. Address County Audr. G. H. Stoddard, Brookings, S. D.

+1158—St. Clairsville, Ohio—Sealed proposals will be received until 1 p.m., Aug. 16, for furnishing the coal requirements of Belmont County Court House and Jail during the ensuing year. A satisfactory bond or certified check for 25% of the amount bid must accompany all proposals. Address County Audr. Emerson Campbell, St. Clairsville, Ohio.

+1159—Plains, Penn.—Sealed proposals will be received by the Board of Education until 7 p.m., Aug. 9, for furnishing the coal required at the local school buildings during the ensuing year. Address Secy., James J. Judge, Bd. of Edu., 5 S. Main St., Plains, Penn.

1160—Kansas City, Mo.—The Park View Hotel at this place will be in the market about Sept. 1 for approximately 200 tons of semianthracite, nut and slack coal. Address Manager, Park View Hotel, 10th and Paseo St., Kansas City, Mo.

+1161—Colorado Springs, Colo.—The Board of Education of this place will contract about Sept. 1 for its annual requirements of coal, amounting to approximately 3000 tons of mine-run lignite. The current contract is being filled at about \$2.50 per ton. The call for bids is advertised and deliveries are to be made as required. Address Board of Education, D. E. Graff Bldg., Colorado Springs, Colo.

1162—Delphi, Ind.—Sealed proposals will be received until Aug. 3, for furnishing the County Poor Asylum, Jail and Court House with approximately 250 tons of anthracite and Hocking Valley or some other grade of soft coal. The coal is to be delivered as required. Address Aud. M. G. Huan, Carroll County, Delphi, Ind.

1163—Carthage, Mo.—The Board of Education will receive bids until Aug. 3, for furnishing 250 tons of Nevius coal to be delivered in the bins of the various buildings. Address Chn. W. F. Maring, Supply Com. Bd. of Edu. Carthage, Mo.

1164—Fargo, N. D.—The Board of Education will receive bids until 8 p.m., Aug. 4, for furnishing 2000 tons of screened lignite coal to be delivered at the different school buildings as required, during the period ending June 1, 1916. Bids are also requested on 200 tons of Pocahontas mine-run. All bids must be accompanied by a certified check for \$100. Address Secy. E. G. Guthrie, Bd. of Edu. High School Bldg., Fargo, N. D.

1165—Greensburg, Penn.—The Board of Education of Greensburg will receive bids until Aug. 4, for furnishing and delivering No. 1 screened coal and good stock coke, to the different buildings as required. Address Secy. Harry E. Blank, Bd. of Edu., Greensburg, Penn.

1166—Emporia, Kan.—The Board of Education will receive bids until Aug. 2, for furnishing its coal requirements during the ensuing year. Address Clk. M. N. Champe, Bd. of Edu., Emporia, Kan.

1167—Guthrie Center, Iowa—Bids will be received until noon, Aug. 3, for furnishing the Guthrie County Court House with coal during the ensuing year. Address Chn. W. H. Neal, Bd. of Supervisors, Guthrie County, Guthrie Center, Iowa.

Contracts Awarded

Note—Successful bidders are noted in **bold face type**.

No. 363—Toledo, Ohio.—This contract (Vol. 7 pp. 566, 955), which provides for furnishing the local Water Works with approximately 6000 tons of coal for use at the Broadway Pumping Station, has been awarded to the **M. A. Hanna Co.** at \$1.90 per ton. Address Supt. P. R. Cook, Water Works Dept. Toledo, Ohio.

+No. 726—New York, N. Y.—This contract (pp. 76, 157) has been awarded as follows: **William Farrell & Son**, Item No. 1, \$6819.50; **Bacon Coal Co.**, Item No. 2, \$3510; **Commercial Coal Co.**, Item No. 3, \$3708. These were the lowest bids on this business. Address Fire Comr. Robert Adamson, Municipal Bldg., New York City.

+No. 810—Oelwein, Iowa.—This contract (Vol. 7, p. 1006), which provides for furnishing the City Government with approximately 900 tons of coal, has been awarded to the **Norwood White Coal Co.** on steam coal at \$2.03 per ton. Address City Clk. E. H. Burlingham, Oelwein, Iowa.

+No. 824—Detroit, Mich.—This contract (Vol. 7, p. 1049), which provides for furnishing the local Board of Health with coal, has been awarded to the **United Fuel & Supply Co.**, **William E. Besancon** and **Daniel Sullivan**. About 2000 tons of bituminous mine-run and 500 tons of anthracite will be required. Address Secy. John F. McKinley, Bd. of Health, 223 St. Antoine St., Detroit, Mich.

No. 929—New Orleans, La.—The price at which this contract was awarded (Vol. 7, p. 1127, Vol. 8, p. 42) was \$2.65 per short ton. The contract calls for Pratt washed nut and slack coal, with a guarantee of 14,500 B.t.u., not to exceed 6% ash or 3% moisture. The contract covers the year from July 1. It was awarded to the **Tennessee Coal, Iron & Land Co.** through its agent, Frank S. Walsh, of New Orleans. Address Fred W. Matthews, Charity Hospital, New Orleans.

Contract Notes

St. Louis—Bids for supplying coal to the City of St. Louis for all city institutions, departments and offices except the waterworks for the twelve months ending July 31, 1916, were opened July 9, at noon. The bids were as follows, the probable successful bid being noted in **full face type**:

	Lump Coal								Nut				Washed				Coke				
	Four Courts and Courthouse	Industrial School	Engine Houses	Parks	Infirmary	All other City offices	Workhouse (car)	Asphalt Plant (car)	Harbor Boat	Harbor Boat (wagon)	Robert Koch Hospital (car)	Sanitarium (car)	Sanitarium (wagon)	City Hospital	City Hall	City Hosp. Inf. & San. ¹	All other offices ²	Fire Dept. ³	All City offices ⁴	Fire Dept.	All other
Boehmer Coal Co.	\$1.88	\$1.86	\$1.98	\$2.03	\$1.98	\$1.98	\$1.49	\$1.49			\$1.74	\$1.31	\$1.62	\$1.49	\$1.79	\$2.54	\$5.14	\$5.49	\$7.89	\$4.82	\$4.80
Polar Wave Ice & Fuel Co.	1.86	1.92	2.00	2.33	....	2.00	1.54	1.54			1.86	1.38	1.58	1.57	1.94	2.62	5.00	5.45	7.85	4.84	4.84
Bald Eagle Mining Co.	1.81	1.91	....	....	1.96	....	1.52	1.52			1.78	1.34	1.59	1.67	1.91	2.60	....	....	....	....	....
Southern Coal, Coke & Mining Co.	1.98	2.10	2.10	2.50	....	2.10	1.67	1.67	....	2.10	1.95	1.42	1.77	....	....	2.75	5.25	5.75	7.85	5.10	5.50
Inland Valley Coal Co.	1.98	2.10	2.10	2.50	....	2.10	1.67	1.67	....	2.10	1.95	1.42	1.77	....	....	....	....	....	....	....
Madison Coal Corporation	....	....	....	....	....	....	....	....	2.25	....	....	....	....	....	....	....	....	....	....	....
Stephan Coal Co.	Stephan Coal Co.	1.89	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Donk Bros.	1.89	....	....	....	....	....	1.60	....	....	....	1.98	1.98	....	....	1.46	1.82	....	5.60	....	....	....
McConnell & Pilcher	1.82	....	....	....	....	....	....	....	....	....	1.98	1.98	....	....	1.43	1.69	....	....	....	....	....
Last year prices	1.77	1.87	1.99	2.00	2.00	2.00	1.48	1.48	1.98	2.00	1.90	1.35	1.60	1.41	1.89	2.57	5.04	5.23	7.90	4.84	5.00
															1.42						

¹ Carterville egg.

² Smokeless.

³ Youghiogheny.

⁴ Anthracite.

Because the bids for delivering lump coal to the harbor boat by wagon were higher than that of the Boehmer Coal Co. for delivering lump to all other city offices, the contract under the harbor boat classification was awarded to the Boehmer Co. under the other classification. The Stephan Coal Co. bid \$5 on Pennsylvania smokeless but as the specifications called for West Virginia smokeless the contract will go to the Polar Wave Co. on its bid of \$5. Comparison with last year's figures shows that the prices are, on the whole, a little lower. The quantities estimated to be required during the year are as follows: Sanitarium Pumping Station, 20,000 tons nut; City Hospital, 12,000 tons washed; City Hall, 10,000 tons washed; Robert Koch Hospital, 3000 tons lump; Work House, 3400 tons lump; Industrial School, 2600 tons lump; Infirmary, 1500 tons lump; Harbor Boat and other offices, 2500 tons lump; coke, 3500 tons; anthracite coal, 250 tons; Youghiogheny coal, 250 tons; Carterville egg, 600 tons; smokeless coal, 600 tons. Address Supply Comr. J. B. Thomas, City Hall, St. Louis, Mo.

+Louisville, Ky.—Contract of the American Creosoting Co. for 3000 tons of screenings per annum has been let to the **Consolidated Indiana Coal Co.** until Apr. 1, 1916.

Corinna, Me.—Burrill & Clark at this place purchase about 600 tons of steam coal per annum as required. They have storage capacity of 200 tons and deliveries are made by water and rail. Address E. R. Clark, Corinna, Me.

+Le Sueur, Minn.—The city contract at this place has been awarded to the **St. John Grain Co.** on "Orient" egg coal to be shipped from Franklin County, Ill. The price was \$1.35 per ton f.o.b. cars at mines.

Fairview, Okla.—The Local Electric Light Dept. consumes approximately 1680 tons of mine-run coal per annum which usually costs about \$3.68 per ton. The business is let on competitive bids. Address Supt. P. H. Wimpey, Fairview, Okla.

Putnam, Conn.—The Putnam Light & Power Co., at this place buys its coal under a 100,000-ton contract made by the Saylesville Bleacheries, at Saylesville, R. I. The business is let on competitive bids, and New River coal is used. Address Gen. Mgr. R. Y. Thurston, Putnam Light & Power Co., Putnam, Conn.

Rock Rapids, Iowa.—The Municipal Electric Light Plant at this place consumes about 1400 tons of coal per annum which is bought entirely in the open market. Iowa steam coal is used principally, and the cost is about \$3.25 per ton. Address Supt. W. F. Gingrich, Municipal Electric Light Plant, Rock Rapids, Iowa.

Carrollton, Ky.—The Light Department at this place consumes about 2200 tons of bituminous nut coal which usually costs about \$2.75 per ton. The business is not done on competitive bids. Address R. L. Bartlett, Carrollton, Ky.

Bayfield, Wis.—The Bayfield Light, Power & Water Plant, at this place consumes about 400 tons of Pittsburgh screenings per annum, the coal being required only during three months. The business is not done on a competitive basis and the approximate cost is \$2.30 per ton. Address Supt. F. M. Herrick, Bayfield Light, Power & Water Plant, Bayfield, Wis.

Watkins, N. Y.—The Watkins Municipal Light & Water Plant, consumes about 1200 tons of bituminous coal per annum which is bought at approximately \$2.30 per ton. No contracts are made and the business is done on a competitive basis. Address Supt. Charles E. Dennis, Watkins Municipal Light & Water Plant, Watkins, N. Y.

	Lump Coal								Nut				Washed				Coke				
	Four Courts and Courthouse	Industrial School	Engine Houses	Parks	Infirmary	All other City offices	Workhouse (car)	Asphalt Plant (car)	Harbor Boat	Harbor Boat (wagon)	Robert Koch Hospital (car)	Sanitarium (car)	Sanitarium (wagon)	City Hospital	City Hall	City Hosp. Inf. & San. ¹	All other offices ²	Fire Dept. ³	All City offices ⁴	Fire Dept.	All other
Boehmer Coal Co.	\$1.88	\$1.86	\$1.98	\$2.03	\$1.98	\$1.98	\$1.49	\$1.49			\$1.74	\$1.31	\$1.62	\$1.49	\$1.79	\$2.54	\$5.14	\$5.49	\$7.89	\$4.82	\$4.80
Polar Wave Ice & Fuel Co.	1.86	1.92	2.00	2.33	....	2.00	1.54	1.54			1.86	1.38	1.58	1.57	1.94	2.62	5.00	5.45	7.85	4.84	4.84
Bald Eagle Mining Co.	1.81	1.91	....	....	1.96	....	1.52	1.52			1.78	1.34	1.59	1.67	1.91	2.60	....	....	....	....	....
Southern Coal, Coke & Mining Co.	1.98	2.10	2.10	2.50	....	2.10	1.67	1.67	....	2.10	1.95	1.42	1.77	....	....	2.75	5.25	5.75	7.85	5.10	5.50
Inland Valley Coal Co.	1.98	2.10	2.10	2.50	....	2.10	1.67	1.67	....	2.10	1.95	1.42	1.77	....	....	....	....	....	....	....
Madison Coal Corporation	....	....	....	....	....	....	....	....	2.25	....	....	....	....	....	....	....	....	....	....	....
Stephan Coal Co.	Stephan Coal Co.	1.89	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Donk Bros.	1.89	....	....	....	....	....	1.60	....	....	....	1.98	1.98	....	....	1.46	1.82	....	5.60	....	....	....
McConnell & Pilcher	1.82	....	....	....	....	....	....	....	....	....	1.98	1.98	....	....	1.43	1.69	....	....	....	....	....
Last year prices	1.77	1.87	1.99	2.00	2.00	2.00	1.48	1.48	1.98	2.00	1.90	1.35	1.60	1.41	1.89	2.57	5.04	5.23	7.90	4.84	5.00
															1.42						

Waukon, Iowa.—The Interstate Power Co. at this place consumes about 700 tons of washed screenings per annum which is usually bought at approximately \$3.40 per ton. The coal is not bought on competitive bids. Address E. B. Gibbs, Interstate Power Co., Waukon, Iowa.

Erie, Penn.—Bids for furnishing the local Fire Department with coal during the ensuing year were opened on July 1, as follows: Burnwell Coal Co., \$5.15, anthracite f.o.b., and \$5.90 in bin; G. B. Gebhardt, \$5.77½ for anthracite f.o.b. and \$5.75 for Pittsburgh coal; Erie Coal Co., \$5.15, anthracite f.o.b., and \$5.65 in bin; Wittman-Pfeffer Co., \$5.15, anthracite f.o.b., \$5.65 in bin, and \$3.75 for Pittsburgh coal; Momeyer Coal Co., \$5.15, anthracite f.o.b., and \$5.65 in bin; Guelcher Bros., \$5.15, anthracite f.o.b., and \$5.90 in bin; Mutual Coal Co., \$5.25, anthracite f.o.b., and \$5.70 in bin; W. L. Scott Coal Co., \$6, anthracite f.o.b., and \$6.35 in bin; Saltzman Coal & Supply Co. and The J. F. Siegel Coal Co. each bid \$5.15 per ton, anthracite f.o.b.

+Portland, Ind.—The contract for the coal needed to operate the city light and power plant for the coming year will be let to the **Southern Coal & Coke Co.**, of Knoxville, Tenn. The coal will be purchased at 90c. per ton the freight rate being \$1.55, making the total cost of \$2.45.